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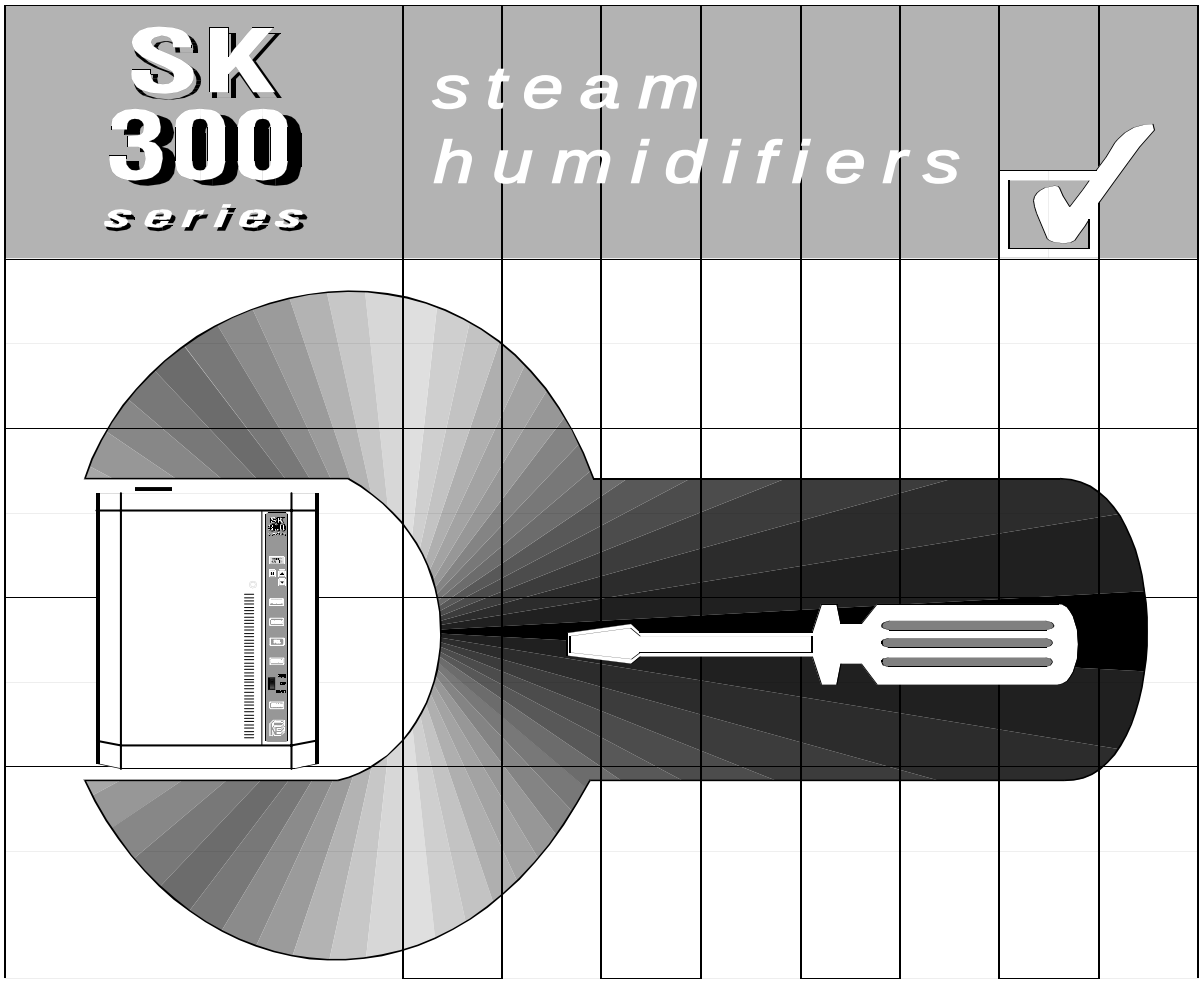

installation and service manual

JANUARY, 2002

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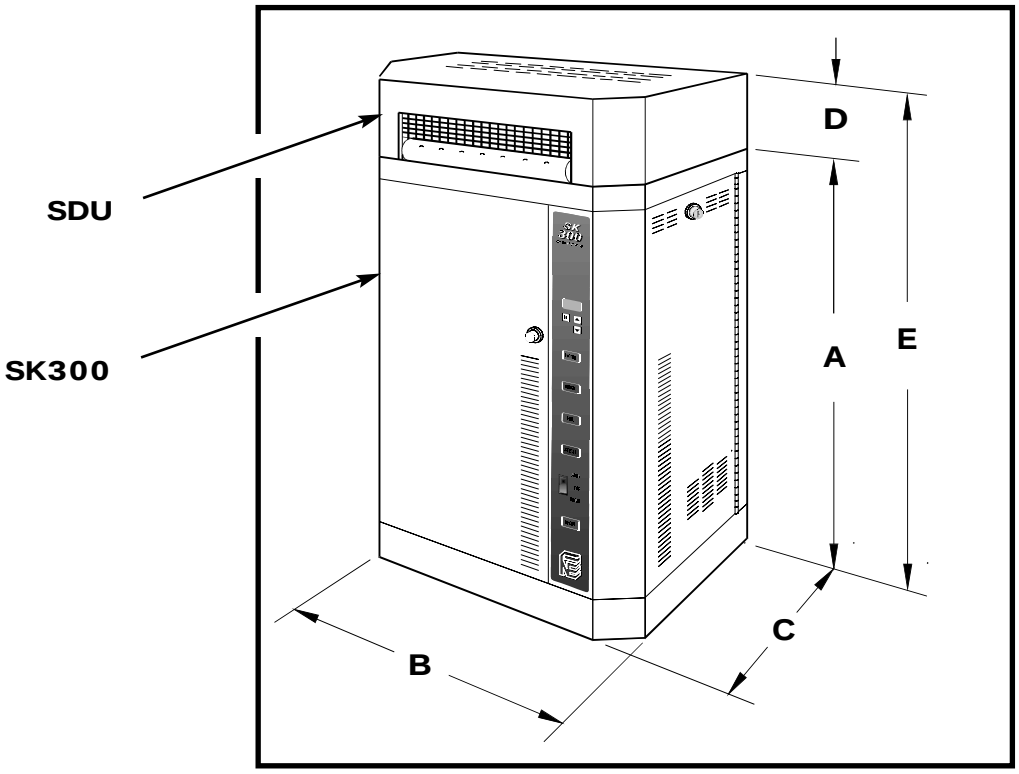
1.00 dimensions:



(fig. #1)

dimensions:

model	A	B	C	D	E ▼	SDU
SK302	597mm 23½ “	470mm 18½ “	292mm 11½ “	143mm 5-5 / 8“	740mm 29-1 / 8 “	SDU-1
SK304	597mm 23½ “	470mm 18½ “	292mm 11½ “	143mm 5-5 / 8“	740mm 29-1 / 8 “	SDU-1
SK306	597mm 23½ “	470mm 18½ “	292mm 11½ “	143mm 5-5 / 8“	740mm 29-1 / 8 “	SDU-1
SK310	724mm 28½ “	533mm 21“	318mm 12½“	168mm 6-5 / 8“	893mm 35-1 / 8 “	SDU-2
SK314	724mm 28½ “	533mm 21“	318mm 12½“	168mm 6-5 / 8“	893mm 35-1 / 8 “	SDU-2
SK320	724mm 28½ “	533mm 21“	318mm 12½“	327mm 12-7 / 8“	1051mm 41-3 / 8 “	SDU-3
SK330	724mm 28½ “	533mm 21“	318mm 12½“	327mm 12-7 / 8“	1051mm 41-3 / 8 “	SDU-3
SK340	794mm 31¼ “	813mm 32 “	318mm 12½“	-	-	-
SK360	794mm 31¼ “	813mm 32 “	318mm 12½“	-	-	-

▼ (SDU - SPACE DISTRIBUTION UNIT)

(table #1)

2.00 output and power consumption:

model	power	capacity	amperage							# of outlets	Ø of outlets
			240/1	208/1	208/3	480/1	480/3	600/1	600/3		
SK302	2 Kw	6 lb/hr 2.73 kg/hr	8.5	10	-	4.5	-	3.5	-	1	1 3/8"
SK304	4 Kw	12 lb/hr 5.5 kg/hr	17	19	11.5	8.5	5	7	4	1	1 3/8"
SK306	6 Kw	18 lb/hr 8 kg/hr	26	30	16.5	13	7.2	10.5	6	1	1 3/8"
SK310	10 Kw	30 lb/hr 14 kg/hr	-	-	28	-	12	-	10	1	1 3/8"
SK314	13.5 Kw	40 lb/hr 19 kg/hr	-	-	38	-	16.5	-	13.5	1	1 3/8"
SK320	20 Kw	60 lb/hr 28 kg/hr	-	-	57	-	25	-	20	2	1 3/8"
SK330	30 Kw	90 lb/hr 41 kg/hr	-	-	-	-	36	-	30	2	1 3/8"
SK340	40 Kw	120 lb/hr 56 kg/hr	-	-	120	-	50	-	40	2	2 1/8"
SK360	60 Kw	180 lb/hr 82 kg/hr	-	-	-	-	72	-	60	3	2 1/8"

(table #2)

Note:

(1) Suffix "M" such as, for example, SK-310M, denotes a modulating humidifier.

(2) Suffix "DI" such as, for example, SK320MDI, denotes a modulating humidifier intended to operate with deionized water supply.

(3) You can limit the maximum output of the modulating units by going through the Menu Driven Program Mode into the "LOCK ON" step.

WARNING!

Irrespective of the programmed output span reduction, the external wiring to the unit must correspond to the maximum amperage as indicated in the above table.

3.00 positioning and installation:

3.10 general recommendations:

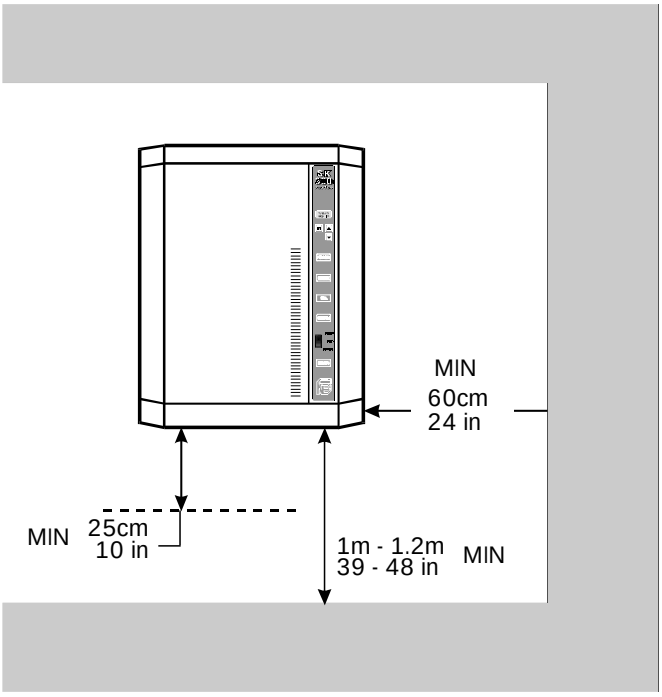
The humidifier should be installed in an easily accessible location to allow proper access for inspection and maintenance. The unit *should never* be installed in a location where an unusual malfunction of the unit can cause damage to the structure of the building, or to very expensive equipment. Typically, the total length of steam hose to the manifold *should not exceed* 5 meters (16 feet).

IMPORTANT

FOR SAFETY REASONS, POWER MUST BE TURNED OFF AT THE EXTERNAL BREAKER WHILE INSTALLING THE UNIT AND BEFORE REMOVING OR DISCONNECTING ANY ELECTRONIC OR MECHANICAL COMPONENTS.
FAILURE TO DO SO IS DANGEROUS AND WILL VOID THE WARRANTY.

3.20 positioning of SK300:

To facilitate service, the unit must be easily accessible from the front and right hand side.
The unit is to be mounted on a wall using keyholes accessible from inside the mechanical compartment (see mounting holes dimensions section). The humidifier should be mounted between 1.0m (39 inches) and 1.2m (48 inches) above floor level. Leave a clearance of at least 25cm (10 inches) under the unit for installation of water supply, drain piping, and electrical connections. A clearance of at least 1.25m (50 inches) from the front of the unit and 60cm (24 inches) from the right hand side is necessary for comfortable access and service. The humidifier should be installed in a normally ventilated area, and ambient temperatures should not exceed 30°C (95°F)



(fig. #2)

3.30 wall mounting:

The mounting of the humidifier on the wall is to be done by using the mounting keyholes accessible from inside the mechanical compartment. Before installation, remove the steam container as described in the maintenance instructions.

note: when marking pilot holes, make sure that the humidifier is level.

3.31 mounting to a stud partition wall:

It is necessary to mount the humidifier directly to the wall studs. For screwing into wooden studs, drill 3/32" pilot holes into the studs and use no. 10 x 1½" wood screws, preferably of the round head type. Screw in the upper screws (supplied by others) until ¼" to ½" of the screw head is left projecting, and screws are firm enough to carry the cabinet weight prior to tightening. With the mechanical door open, and according to the cabinet size and weight and with the assistance of another person, hang the upper keyhole slots over the projected screws. Carefully lower into position flat against the wall and tighten. On larger units (SK310 and up), also apply lower screws. Tighten all screws securely.

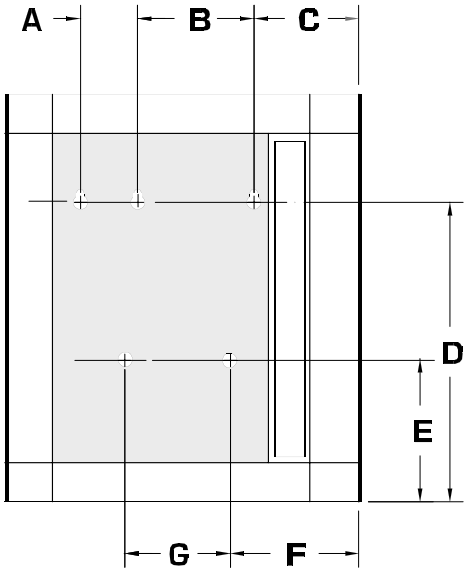
3.32 mounting to a masonry wall (brick, concrete, solid block):

The wall must be sufficiently solid to provide a secure anchorage. Use ¼" threaded x 2¼" minimum length stud bolt anchors which provide an externally threaded stud protruding from the wall as per instructions. Drill hole with size and depth to bolt. Drive in stud bolt anchor. With stud bolt anchors securely in place, position the mounting keyholes over the protruding studs and carefully lower the humidifier into position against the wall surface. According to the cabinet size and weight, use another person to assist you in placing the unit. Apply washer and nuts and tighten fully to torque recommended by the bolt supplier. On larger units (SK310 or larger), also apply the lower mounting holes.

3.33 mounting holes dimensions:

dim	SK 302, 304, 306	SK 310, 314, 320, 330	SK 340, 360
A	-	-	102mm 4“
B	203mm 8“	254mm 10“	305mm 12“
C	132mm 5-3/16“	203mm 8“	267mm 10½“
D	502mm 19¾“	549mm 24-5/8“	622mm 27½“
E	-	279mm 11“	279mm 11“
F	-	203mm 8“	468mm 18-3/8“
G	-	254mm 10“	-

(table #3)

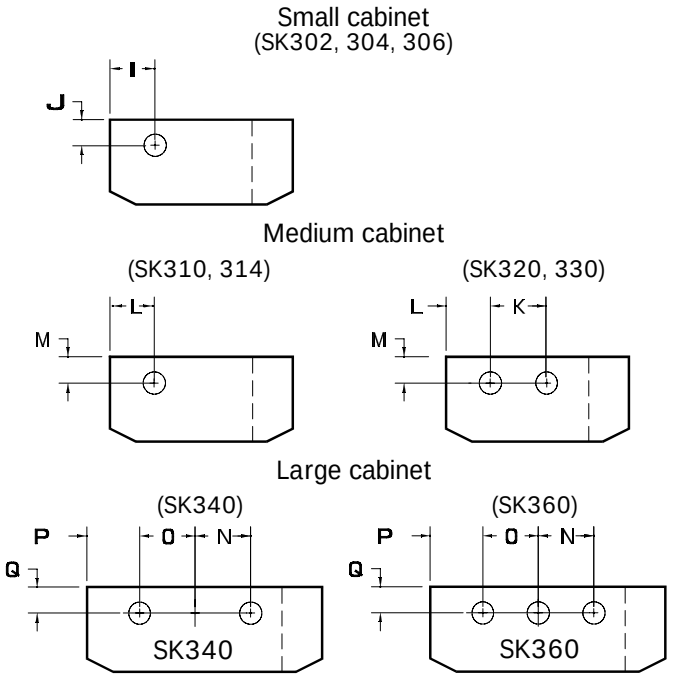


front view *(fig. #3)*

3.40 steam output positions:

dim	SK 302, 304,306	SK 310, 314	SK 320, 330,	SK 340,360
I	110mm 4-5/16“	-	-	-
J	122mm 4-13/16“	-	-	-
K	-	-	134mm 5-9/32”	-
L	-	102mm 4“	102mm 4“	-
M	-	143mm 5-5/8“	143mm 5-5/8“	-
N	-	-	-	179mm 7“
O	-	-	-	179mm 7“
P	-	-	-	132mm 5-3/16“
Q	-	-	-	144mm 5-11/16“

(table 4)



(fig. 4)

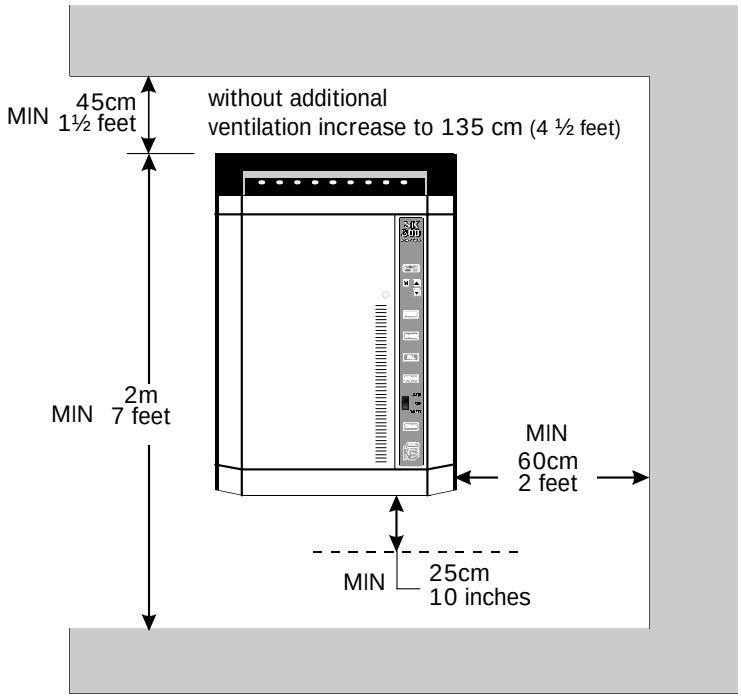
3.50 SK300 (SDU): space distribution unit

The **SDU units** are mounted in the same fashion as standard units.
Note that:

a) The humidifier should be mounted such that the fan section is at least 2m (7 feet) above the floor.

b) A minimum clearance of 450mm (1½ feet) from the ceiling should be allocated to avoid ceiling and wall condensation.

Note: *If additional ventilation is not present, the fan must have a clearance from the ceiling of at least 1350 mm (4 ½ feet). Proper ventilation must be observed to avoid ceiling and wall condensation.*



(fig. 5)

SK300 (SDU):
space distribution unit-remote mounted

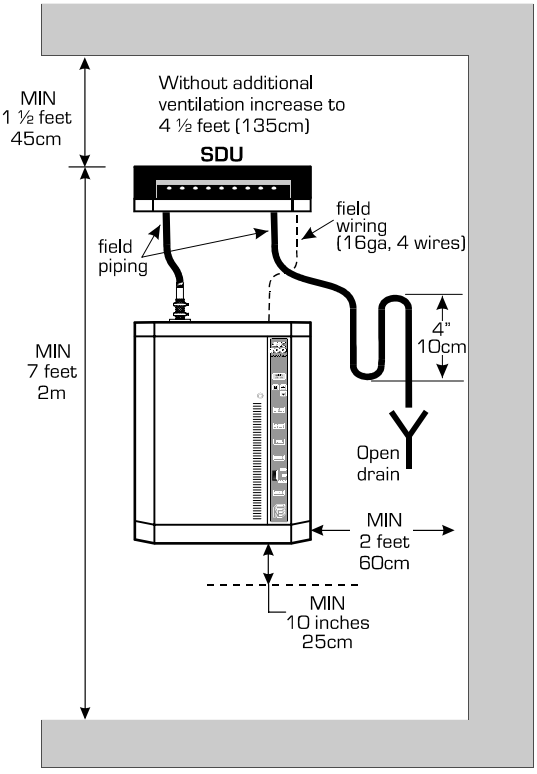
The SDU units are mounted in the same fashion as standard units.
Note that:

a) The humidifier should be mounted such that the (SDU) fan section is at least 2m (7 feet) above the floor.

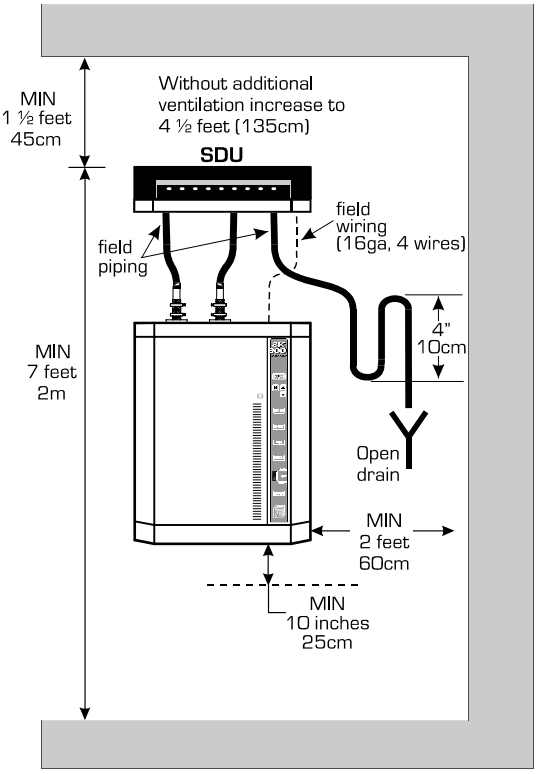
b) A minimum clearance of 45 cm (1½ feet) from the ceiling should be allocated to avoid ceiling and wall condensation.
Note: If additional ventilation is not present, the fan must have a clearance from the ceiling of at least 135 cm (4 ½ feet). Proper ventilation must be observed to avoid ceiling and wall condensation.

C) The humidifier can be in a different location from the SDU. Follow all piping recom mendations in the installation manual.

For SK302 to SK310

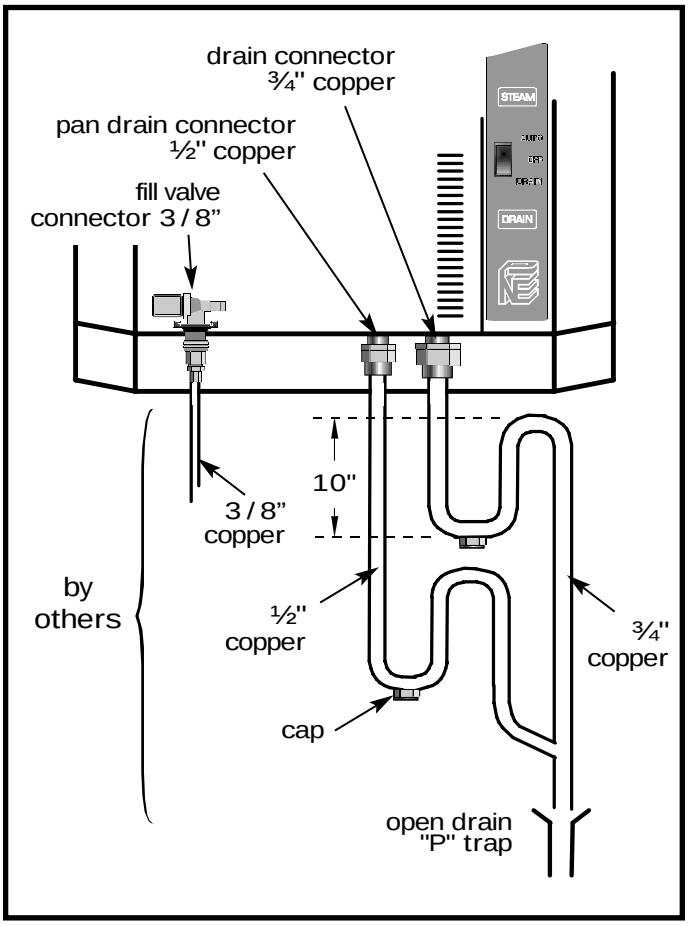


For SK314 to SK330



4.00 plumbing connections:

The SK300 humidifiers are independent of variable water conditions and can operate equally well with hard or soft water. Therefore, for normal operation, no pre-treatment of water is ne-cessary.



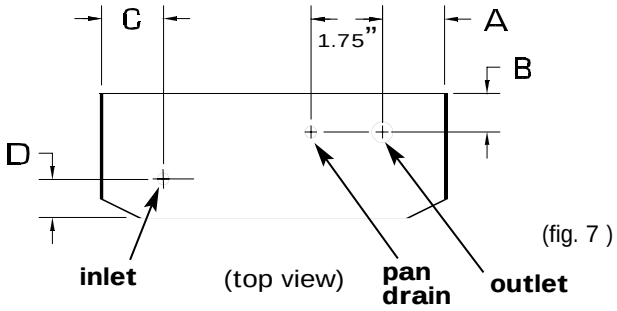
(fig. 6)

4.10 shut off valve:

An isolating shut off valve should be fitted in the water supply line to the unit and installed close to the humidifier to facilitate servicing. It is recommended to install a standard water strainer in the water supply line.

4.20 drain connection:

The outlet for the two drain connections is a copper connector on the underside of the unit. Standard copper pipe can be used to provide the connection between the unit and the two drain connectors.
Ensure proper drainage from the unit, especially if more than one unit is evacuating into the same drain line. The temperature rating on the drain must be 83°C (180°F) minimum.
Follow the drain detail drawing as shown on the right. All plumbing locations are shown in the drawing on the right. (fig. #6)



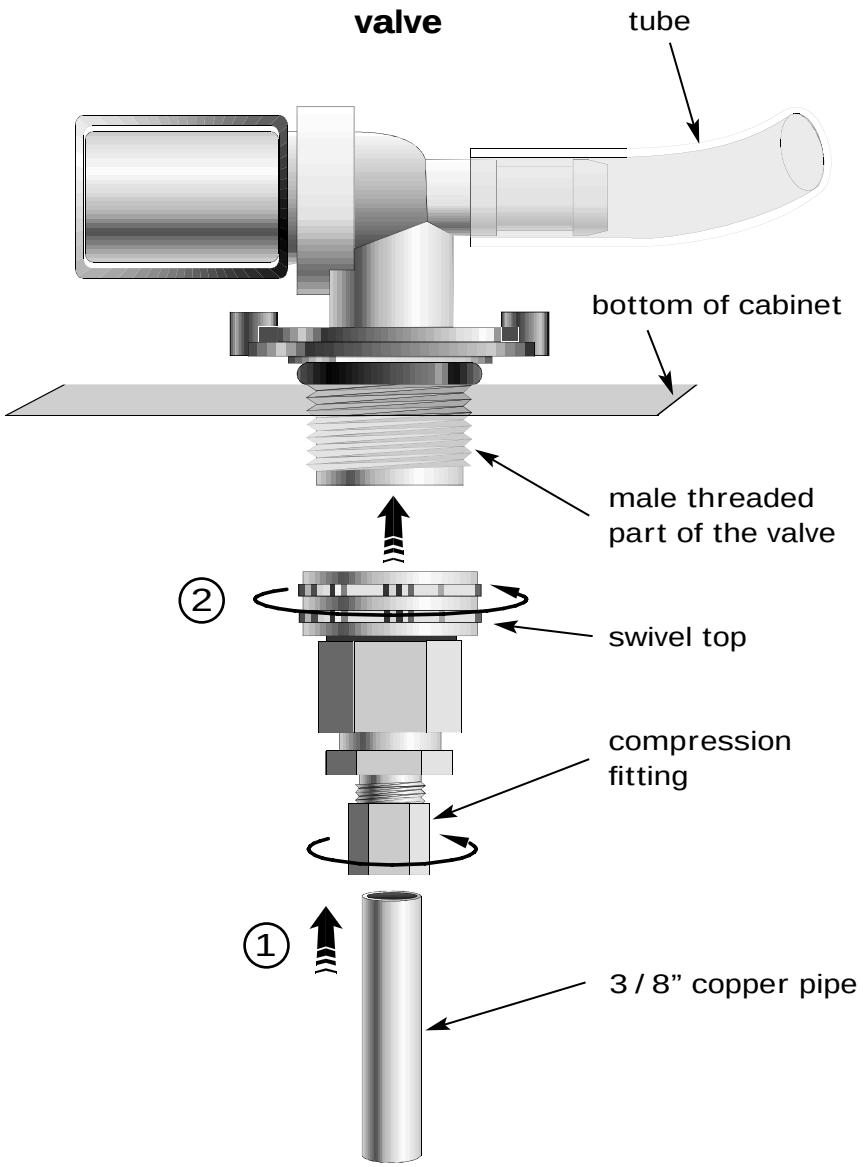
(fig. 7)

model	A	B	C	D
SK302, 304,306	165mm 6½“	51mm 2“	105mm 4-1 / 8“	60mm 2-3 / 8“
SK310, 314, 320, 330	184mm 7¼“	44mm 1¾“	105mm 4-1 / 8“	70mm 2-¾“
SK340, 360	179mm 7“	44mm 1¾“	105mm 4-1 / 8”	70mm 2-¾“

(table 5)

4.30 water connection of the SK300:

ATTENTION! Please respect the following sequence of installation.



(fig. #8)

1. Connect 3 / 8" copper pipe to the bottom 3 / 8" compression fitting.

2. Finger tighten the swivel top fitting to the male threaded part of the valve. (Do not tighten with a wrench!)

4.40 water connections:

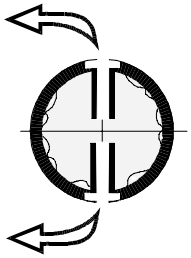
The water inlet specifications are:

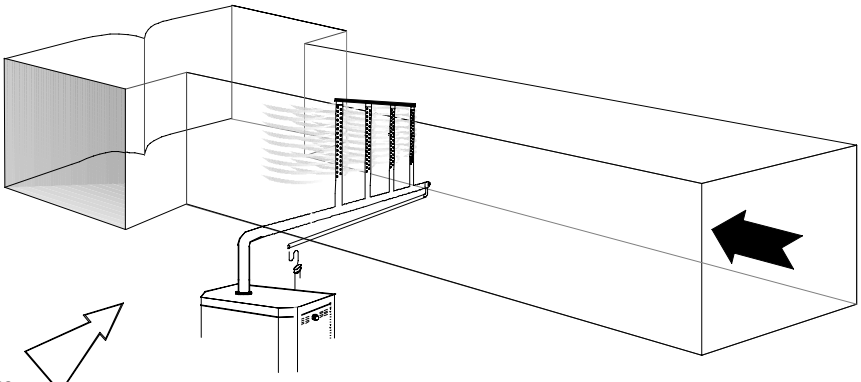
** 10 to 70 psig inlet water pressure*
** 30°C (85°F) maximum temperature*
** 3 / 8" standard copper water line connection (3 / 8" OD)*
** 3 / 8" copper fitting compression supplied with unit.*

5.00 installation of steam hoses and steam pipes:

steam absorption:

In order to prevent the accumulation of condensation in air ducts, NEP has designed 4 basic configurations of steam distribution to provide the client with the most economical solution for any particular application.

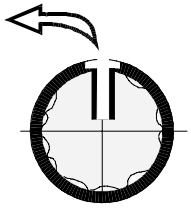


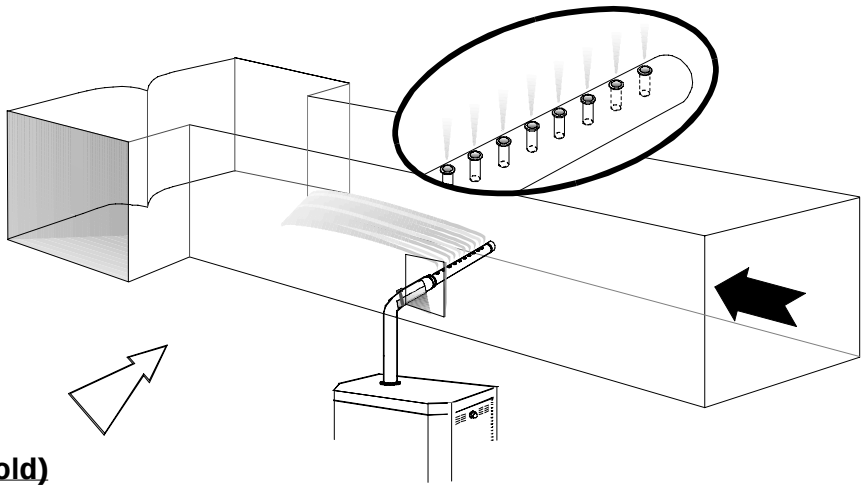


(fig. 9)

A) "MULTI-STEAM" system:

The **MULTI-STEAM** system is to be installed in critical locations in air handling systems, particularly where absorption distances are very short (less than 3 feet) or low air duct temperatures are in effect.



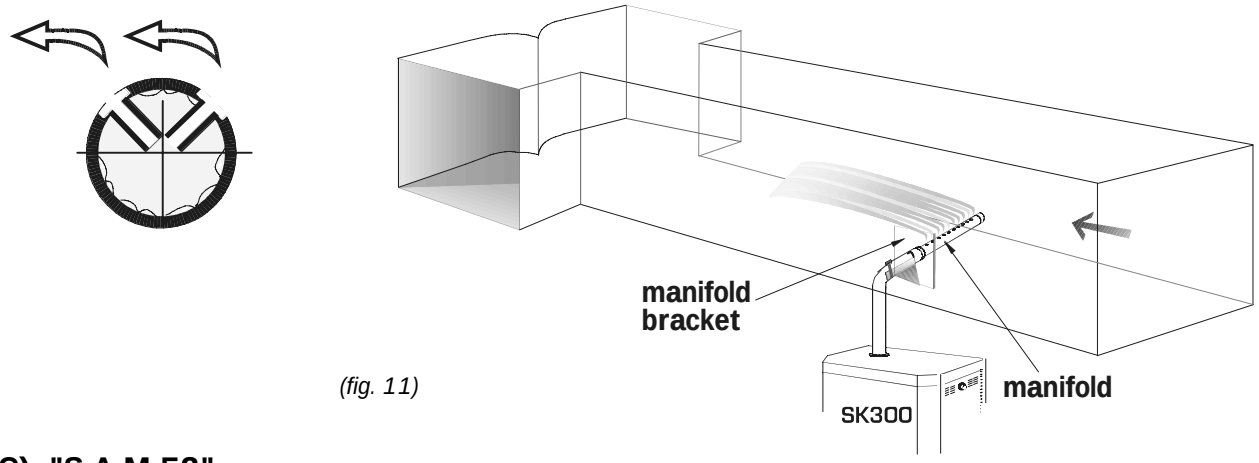


(fig. 10)

B) "S.A.M." (steam absorption manifold)

The **SAM** is to be installed where absorption distances are short (less than 5 feet) and / or low duct temperatures are in effect.

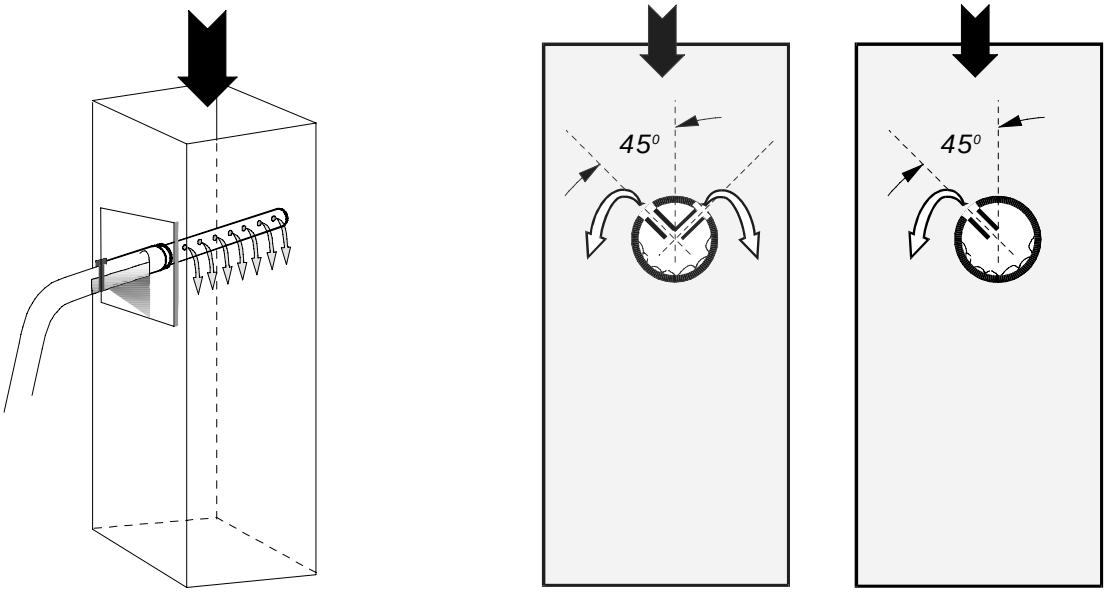
note: for critical absorption distances, contact the factory at: 1-800-361-2308 or 1-514-333-1433



(fig. 11)

C) "S.A.M.E2" (steam absorption manifold)

The **S.A.M.E2** is to be installed where absorption distances are short (less than 5 feet) and / or low duct temperatures are in effect. **S.A.M.E2** are used in applications with restricted duct dimensions.



(fig. 12)

D) "vertical" manifold:

S.A.M. OR S.A.M.E2 MANIFOLDS are used where the absorption distances are normal and the client requires for an economical as well as an efficient solution.

note: for critical absorption distances, contact the factory at: 1-800-361-2308 or 1-514-333-1433

5.10 installation of steam hoses and steam pipes:

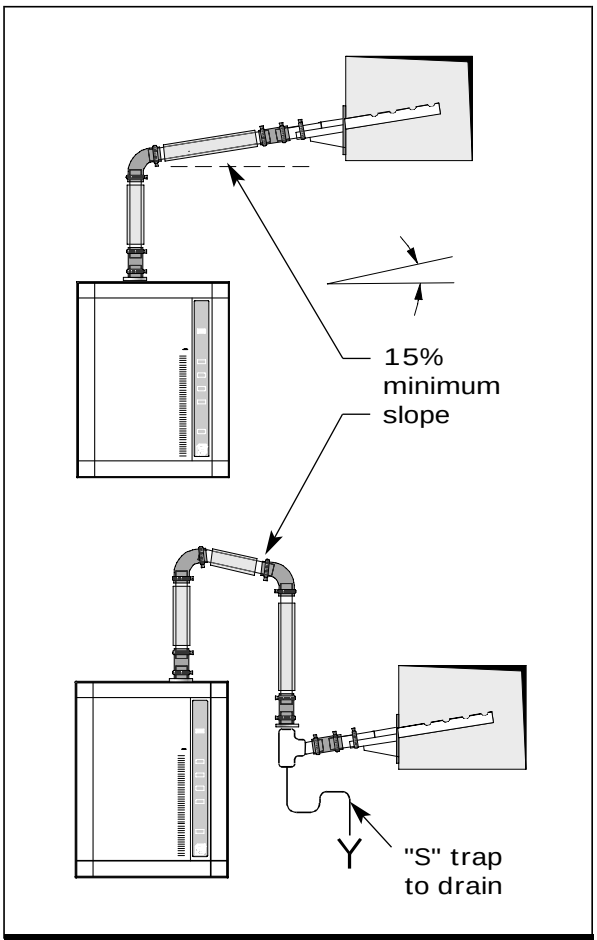
Follow these general rules when installing rigid copper piping or flexible hose to carry the steam from the humidifier to the steam distributors.

A) At no point of the installation should the slope of the steam hose or pipe be less than 15% which means 7 horizontal length to 1 vertical length. This is important to ensure continuous drainage of condensation back to the humidifier or to the steam trap.

B) The lowest point of any steam hose or rigid pipe run must be the humidifier, or steam trap (S type). The "S" separator must have a trap higher than the static pressure of the system by at least 2 inches.

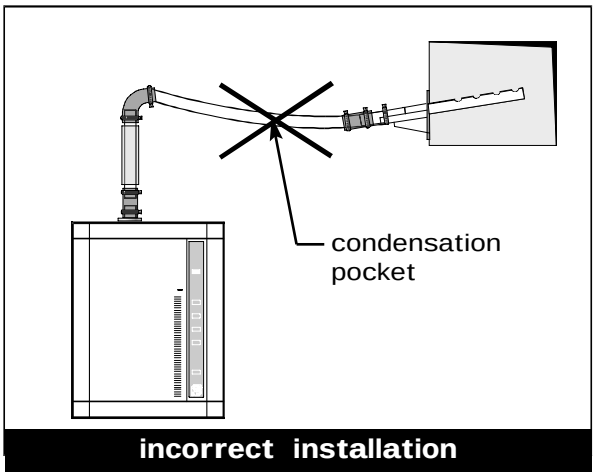
C) Total length of the steam hose, or rigid pipe should not exceed 5 meters (16 feet). Longer runs will result in added condensation losses. Whenever possible, use insulated copper piping. "Flexible" steam hose should be used for short runs (up to 5 meters) or for interconnecting between the rigid pipe runs.

D) Whenever using rigid copper pipe 1- 3/8" or 2-1/8" for larger units, use pipe insulation to diminish condensation build up.



correct installation

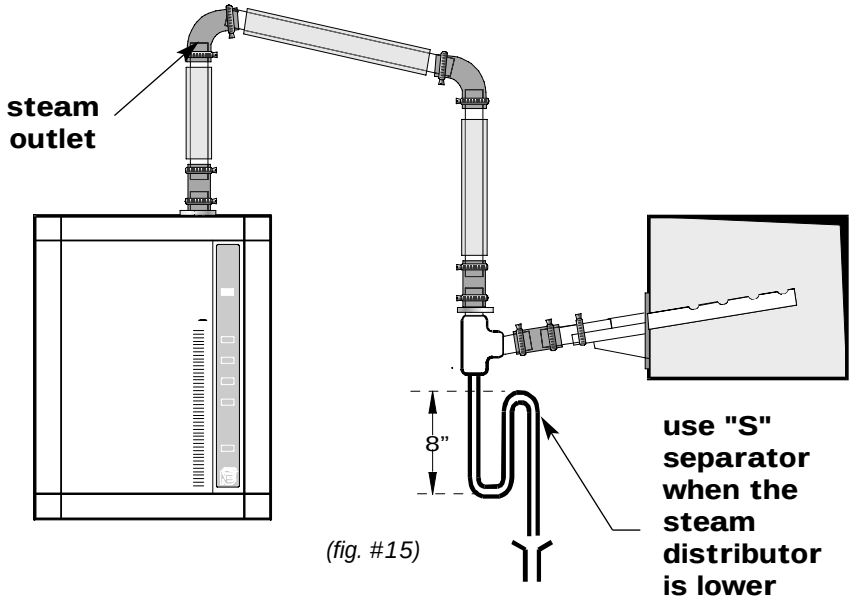
(fig. #13)



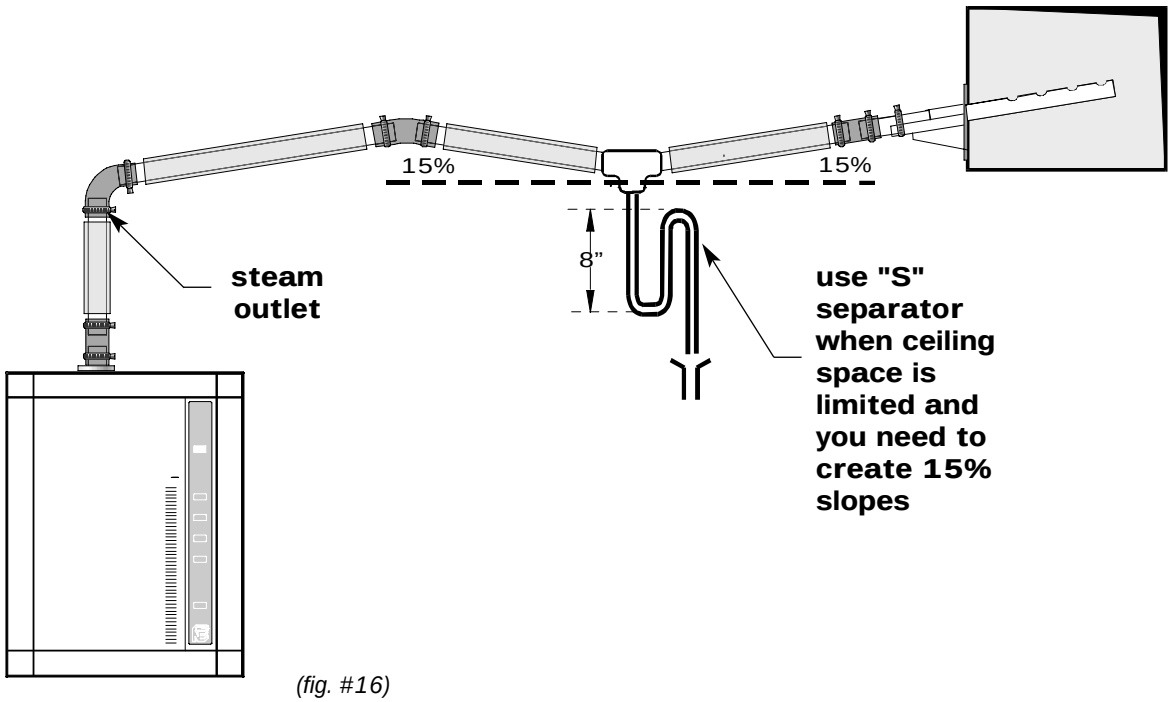
incorrect installation

(fig. #14)

5.20 installation of "S" straps with steam supply hose and pipe:

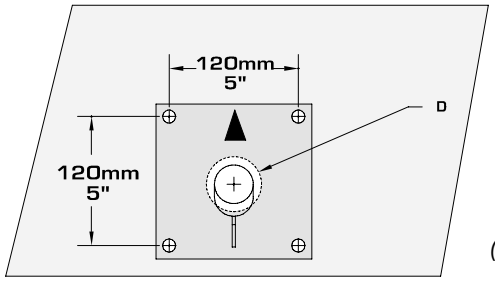


(fig. #15)



(fig. #16)

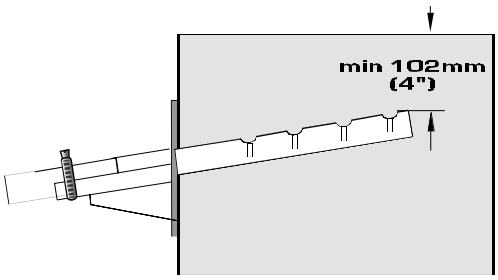
5.30 positioning of REGULAR or S.A.M. manifolds in the horizond duct:



(fig. 17)

diameter duct mounting detail of steam distribution pipe support bracket

unit 35mm (1-3 / 8")
D = 2"
unit 54mm (2-1 / 8")
D = 3

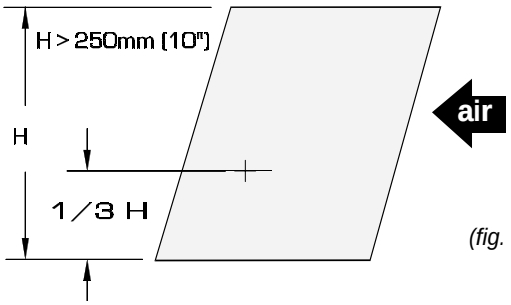


Note: Since the manifold is sloped at a ration of 8 horizontal lengths to 1 vertical length, ensure that the minimum distance of the end of the manifold is at least 4 inches from the top of the duct.

(fig. 18)

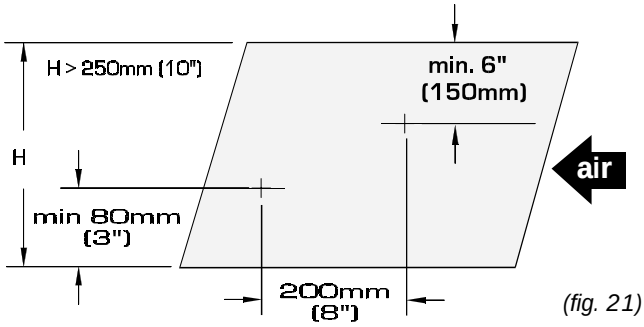
Once location has been determined:

*** For 35mm (1-3 / 8") diameter manifold:**
use the template and drill a hole 51mm (2") for pipe installation. Secure using appropriate sheet metal screws (supplied by others).
Follow the drawings below to determine proper placement of the steam pipes in the duct.



(fig. 19)

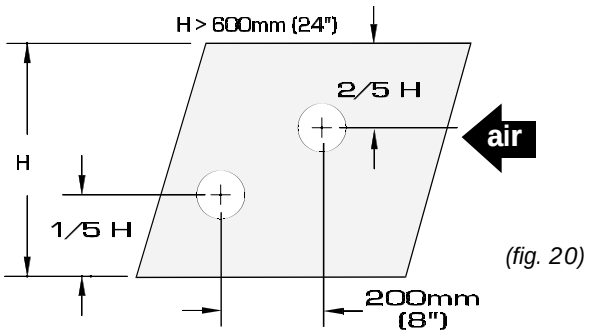
1 steam distributor pipe 35mm (1-3 / 8")



(fig. 21)

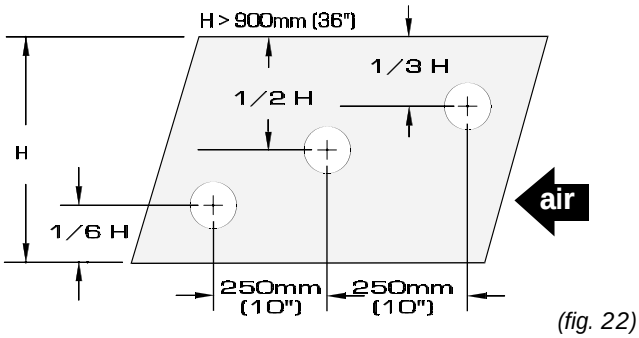
2 steam distributor pipes 35mm (1-3 / 8")

*** For 54mm (2-1 / 8") diameter manifold:**
use the template and drill a hole 78mm (3") for pipe installation. Secure using appropriate sheet metal screws (supplied by others).
Note that the 54mm (2--1 / 8") steam pipe must be supported on the end by an appropriate duct hanger / strap (supplied by others).
Follow the drawings below to determine proper placement of the steam pipes in the duct.



(fig. 20)

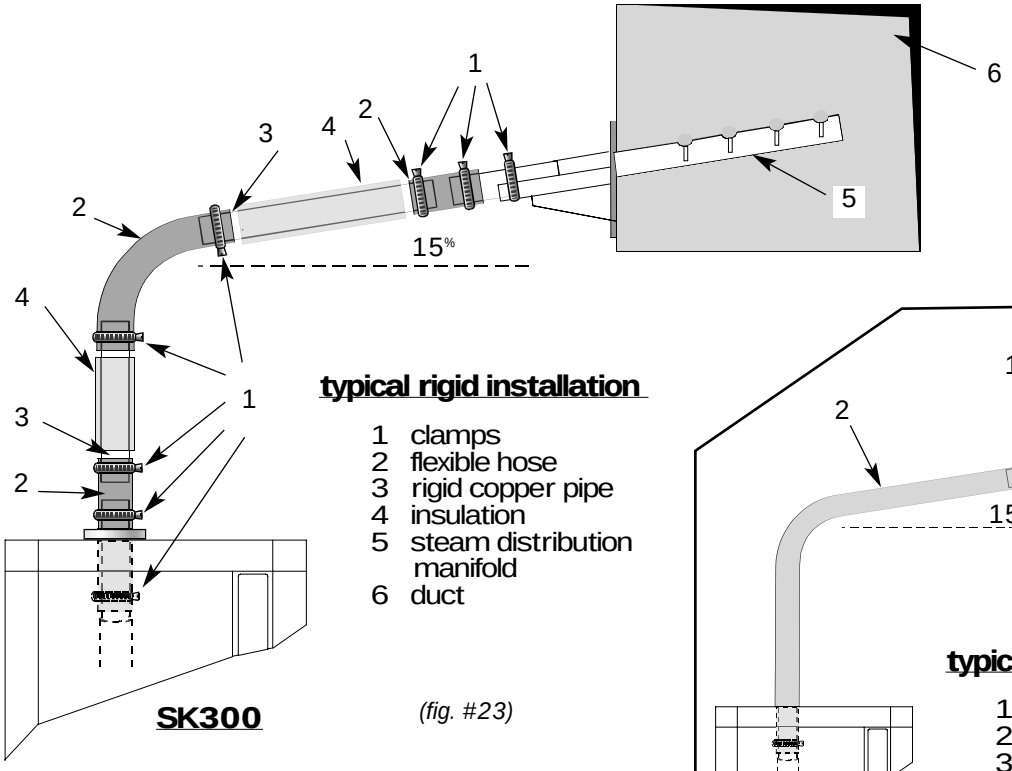
2 steam distributor pipes 54mm (2-1 / 8")



(fig. 22)

3 steam distributor pipes 54mm (2-1 / 8")

5.40 installation of S.A.M. or REGULAR steam distribution pipes:

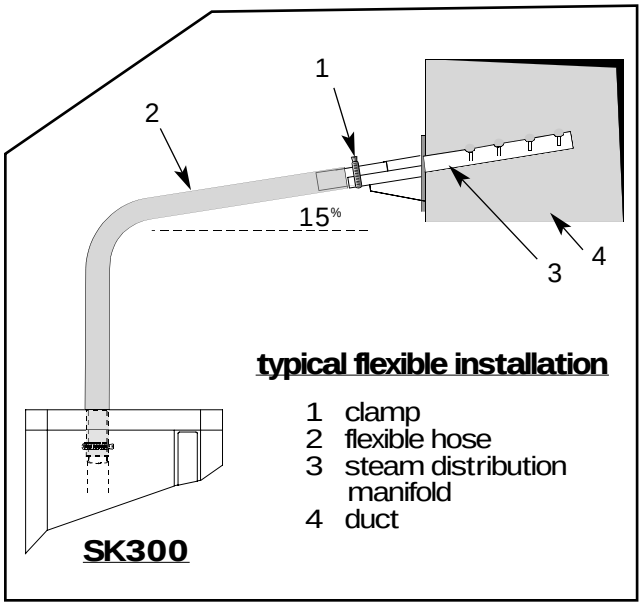


typical rigid installation

1 clamps
2 flexible hose
3 rigid copper pipe
4 insulation
5 steam distribution manifold
6 duct

(fig. #23)

Notes:
Ensure that the flexible hose is not kinked.
A minimum slope of 7 horizontal to 1 vertical lengths must be respected in order to ensure drainage of condensation back to the humidifier or to the steam trap.



typical flexible installation

1 clamp
2 flexible hose
3 steam distribution manifold
4 duct

(fig. #24)

5.50 S.A.M. or Regular steam distribution pipe requirements:

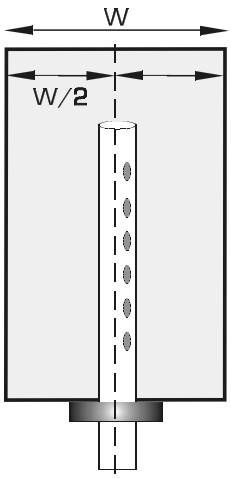
SK300 model	302	304	306	310	314	320	330	340	360
max output (lb / hr)	6	12	18	30	40	60	90	120	180
max output (Kg / hr)	2.7	5.5	8	14	19	28	41	56	82
# 35mm (1-3 / 8") pipes	1	1	1	1	1	2	2	-	-
#54mm (2-1 / 8") pipes	-	-	-	-	-	-	-	2	3
min. pipe length (mm)	300	300	300	600	600	600	750	750	750
min. pipe length (in)	12	12	12	24	24	24	32	32	32
max pipe length (mm)	600	600	600	1200	1200	1200	1500	1500	1500
max pipe length (in)	24	24	24	48	48	48	64	64	64
max. static pressure (in W.G.)	5 (1245)	5 (1245)	5 (1245)	5 (1245)	5 (1245)	5 (1245)	5 (1245)	5 (1245)	5 (1245)

note: for higher static pressure, please contact the factory.

(table #6)

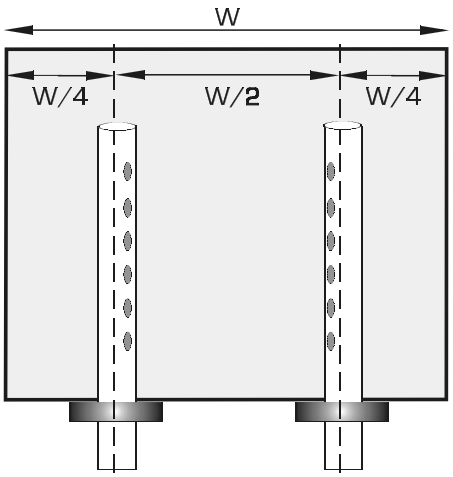
5.6 positioning of S.A.M. or S.A.M.E2 manifolds (1-3/8", 35mm or 2-1/8", 54mm) in vertical ducts:

Follow the drawings below to determine proper placement of the steam pipes in the duct.



one pipe vertical

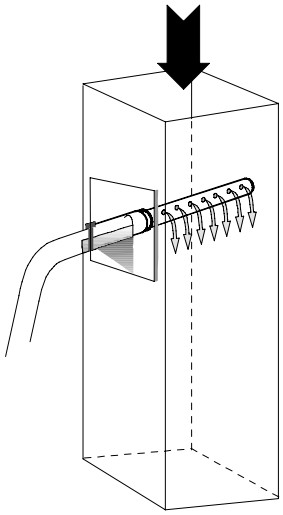
(fig. #25)



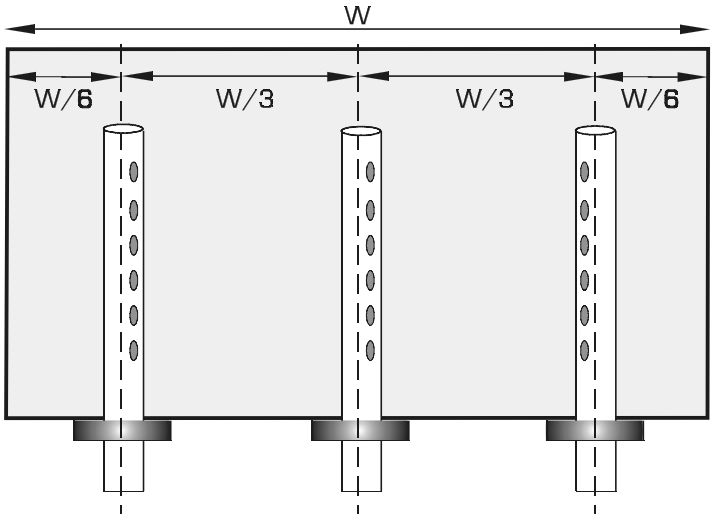
two pipes vertical

top view

(fig. #26)

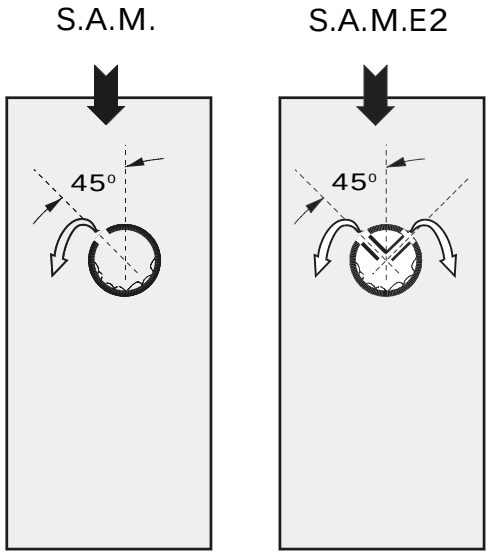


(fig. 28)



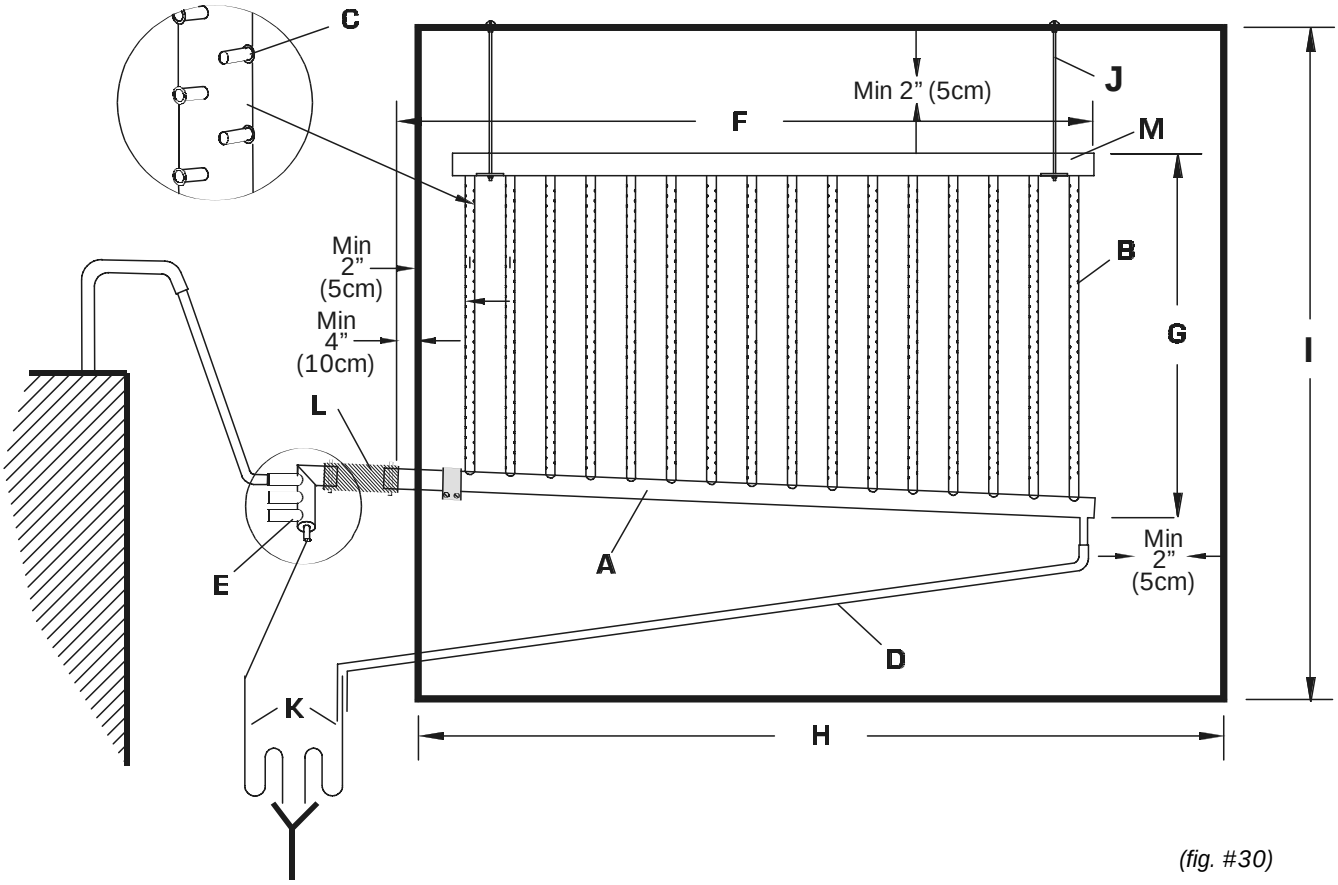
three pipes vertical
54mm (2 1/8") distributors only

(fig. #27)



(fig. #29)

5.70 M.S. (Multi Steam) manifold:



(fig. #30)

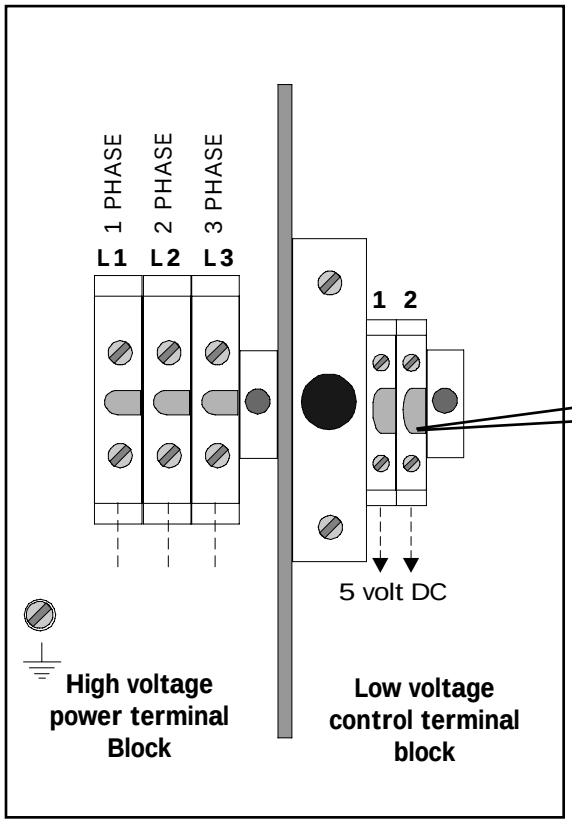
A Main Steam Header stainless steel
B Steam Manifolds 1-3 / 8" stainless steel
C Typical Steam Nozzle
D Condensation Run 3 / 4" (by others)
E Steam Adapter
F Length of Header
G Height of Manifold
H Duct Width
I Duct Height
J Hangers (by others)
K "U" Trap (by others)
L Flexible Steam Hose
M 2" Bracket or stainless steel nut

6.00 electrical connections:

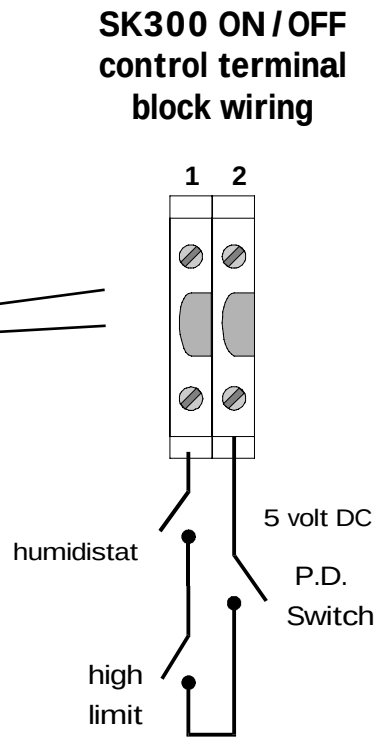
WARNING!

High voltage power terminal block are designated L1, L2, L3
Low voltage control terminal blocks are designated 1,2,3,4
DO NOT INTERCHANGE!!

6.10 SK300 ON/OFF units: (Low voltage control terminals)



(electrical compartment detail) *(fig. #31)*

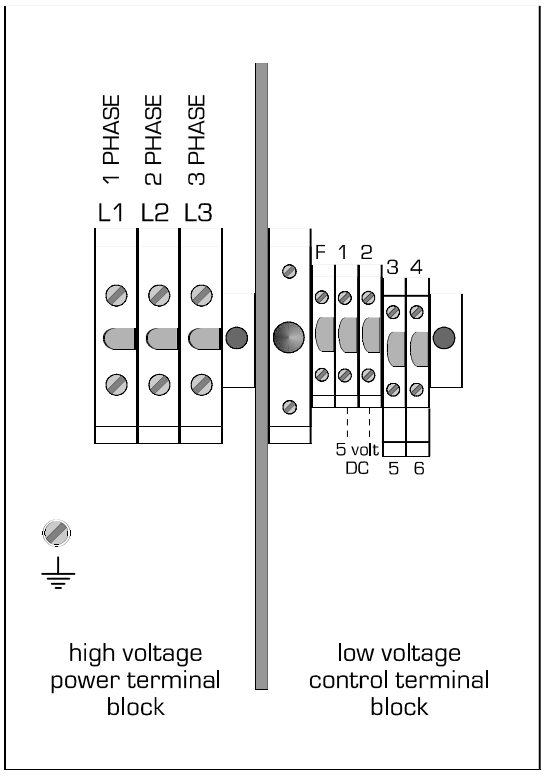


(fig. #32)

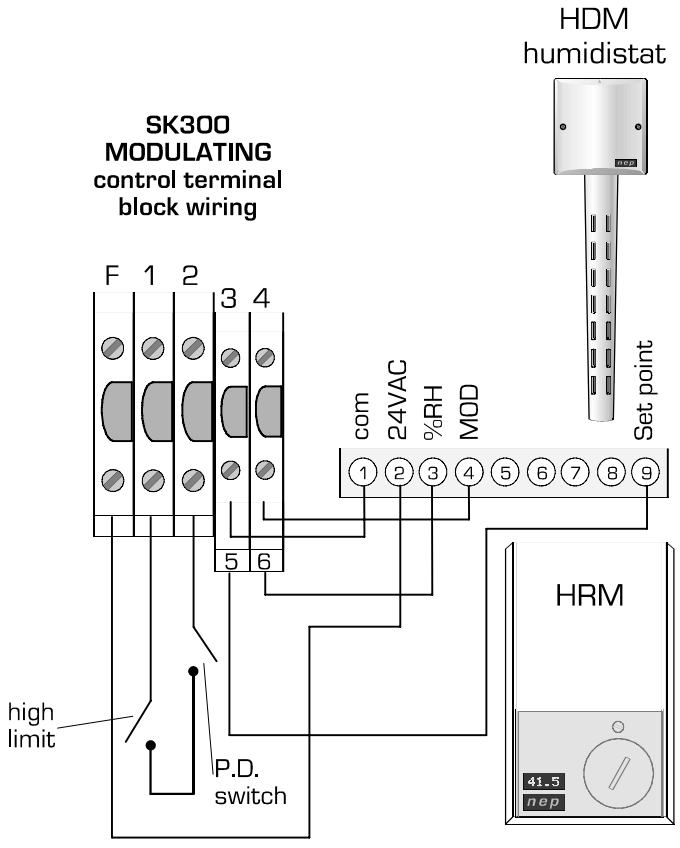
6.20 SK300 modulating units: (Low voltage control terminals)

WARNING!

High voltage power terminal block are designated L1, L2, L3
Low voltage control terminal blocks are designated 1,2,3,4
DO NOT INTERCHANGE!!



(electrical compartment detail) *(fig. 33)*



(fig. 34)

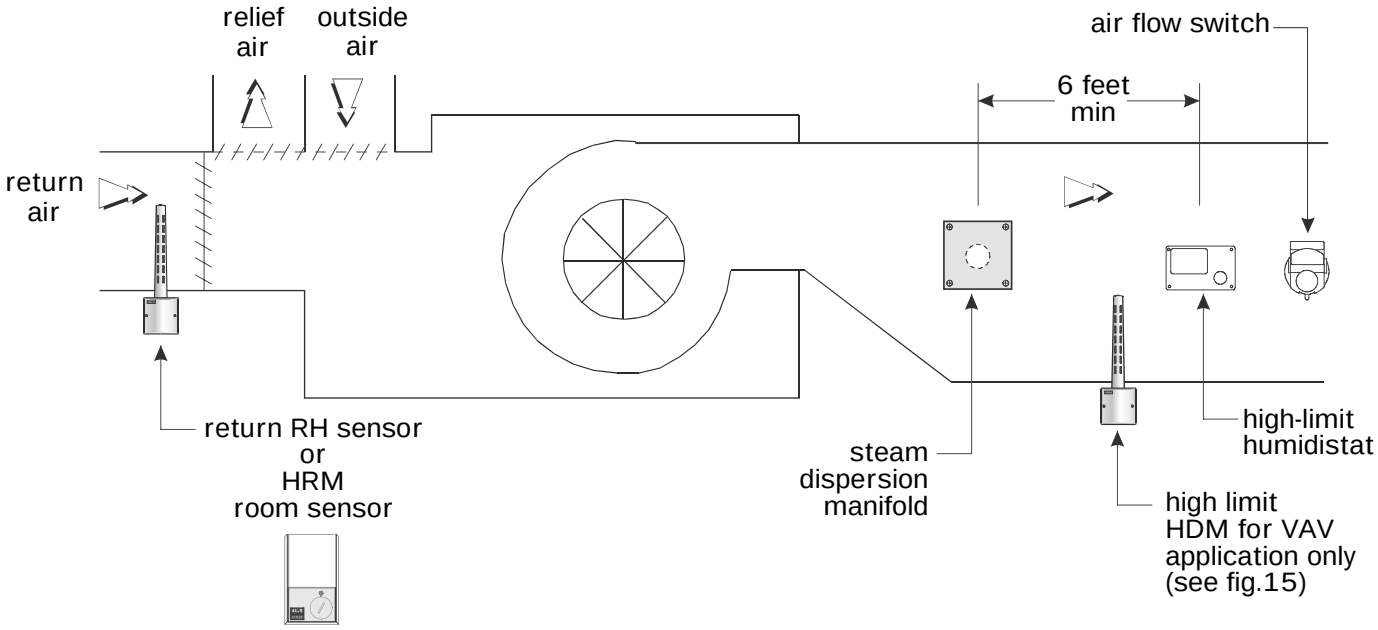
Controls placement

A typical humidifier control system includes a wall or return duct humidistat, a high limit duct humidistat, and an air proving switch. Placement of these devices is critical to proper operation of the overall system.

The return air RH humidistat must always be located BEFORE any outside air intake, in order to insure accurate sensing of the air from the space. Alternatively, a room RH humidistat can be used. The room humidistat should be located on an inside wall or column. It should not be near any discharge air from supply ducts or sources of heat or cold.

The airflow switch must be positioned to accurately open on a loss of air flow, to prevent the humidifier from running when there is no air to absorb the moisture.

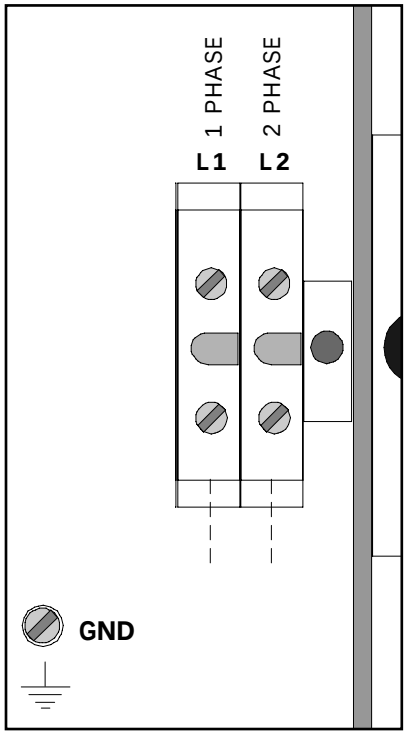
The high-limit humidistat must be positioned far enough downstream of the steam dispersion manifold(s) to prevent it from getting wet, but still allow it to accurately prevent overhumidification of the duct that could result in condensation.



6.30 power supply connections:

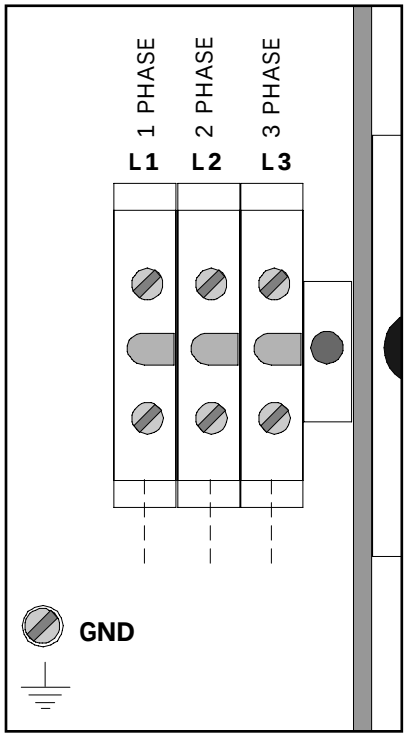
The wiring to the SK300 unit should be done by a *qualified electrician, and external over current protection should comply with local codes.*
A disconnect circuit breaker should be connected and placed adjacent to the unit.
Appropriately sized cable connectors should be used in the knock-outs at the bottom of the electrical compartment of the humidifier for strain relief. Terminal connections must be properly secured.

single phase connection
SK302, 304, 306 terminal block
SK302M, 304M, 306M terminal block



(fig. #35)

3 phase connection
SK304, 306, 310, 314, 320, 330, 340, 360 terminal block
SK304M, 306M, 310M, 314M, 320M, 330M, 340M, 360M terminal block



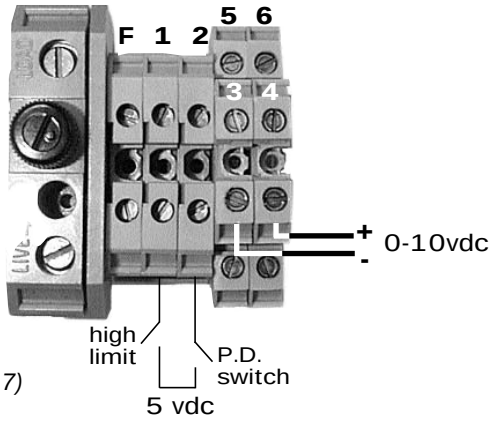
(fig. #36)

6.40 SK300M proportional unit:

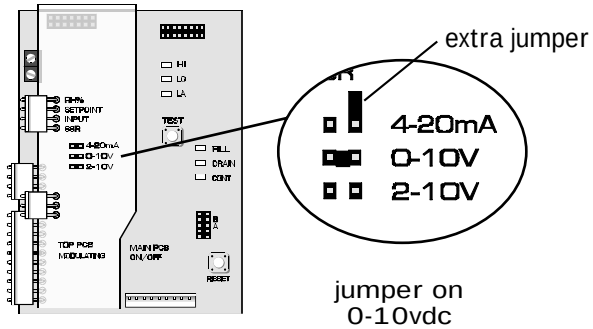
To connect proportional controls to the humidifier:
* Ensure proper connection to the appropriate terminal blocks.
* Position the shunt jumpers on the proportional board to correspond to the appropriate control signal.

terminal block	modulating p.c. board

control signal 0-10vdc:



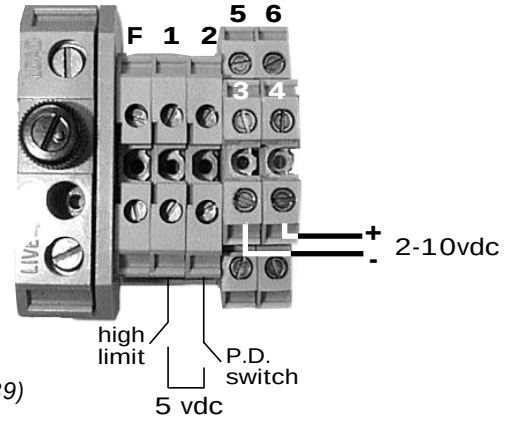
(fig. 37)



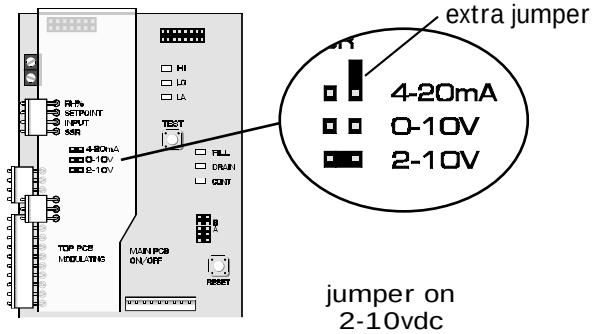
jumper on 0-10vdc

(fig. 38)

control signal 2-10vdc:



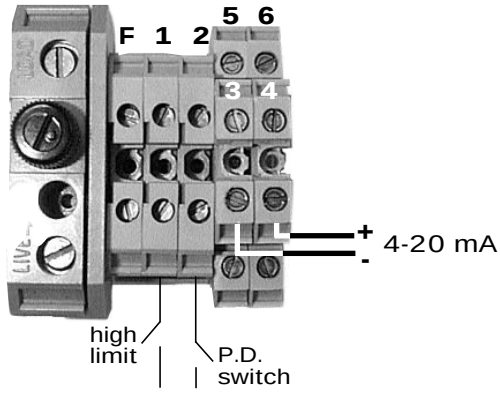
(fig. 39)



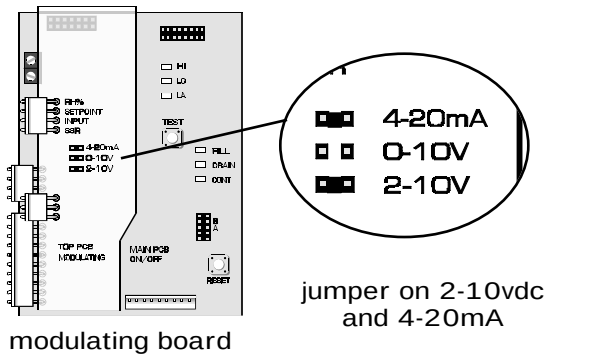
jumper on 2-10vdc

(fig. 40)

control signal 4-20mA



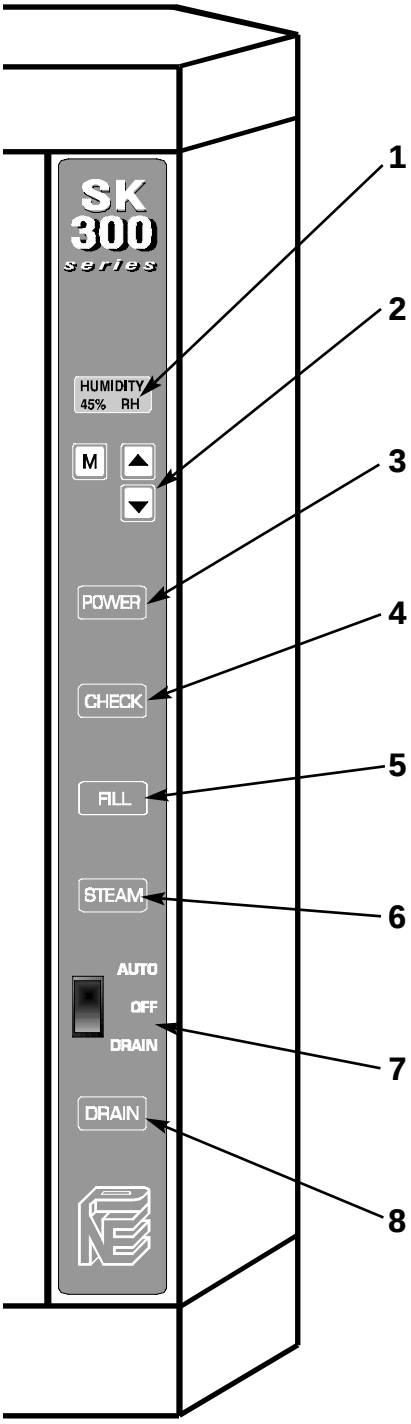
(fig. 41)



jumper on 2-10vdc and 4-20mA

(fig. 42)

7.00 front panel display features:



(fig. #43)

indicators and switches:

1. **Alphanumeric Display** operates in 3 modes:
   - A. Scroll Mode — Continuously indicates %RH, actual steam output and water level.
   - B. Diagnostic Mode — Indicates some operational parameters such as time delay on power contact or abnormal conditions such as overheating in the container, end of season automatic drain, service hours, etc.
   - C. Menu Driven Program Mode — Is used to change operational parameters such as R.H., set point, frequency of drain cycles, output capacity adjustment 10 @ 100%.

2. **Menu & Up / Down Button Controls**
   - Menu Button — Is used to place the SK300 in the Menu Driven Program Mode.
   - Up / Down Buttons — Are used to increase or decrease the controlled parameters of the humidifier.

3. As long as the main power of the unit is connected the **"POWER"** indicator will be lit, irrespective of the position of the rocker switch (fig. 43 #7).

4. The **"CHECK"** indication is normally off. It will go on as a warning against abnormal conditions of operation. For details consult the Alphanumeric Display (fig. 43 #1)

5. The **"FILL"** indication lights when the water supply (fill) valve is open.

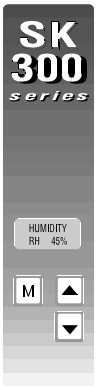
6. The **"STEAM"** indication functions differently for modulating and on / off units. In on / off units, the **STEAM** indicator lights when the contactor is closed and steam is being generated. In modulating units, the **STEAM** indicator blinks on and off in proportion to the percentage of steam output the humidifier is generating. For example, for 30% demand, the **STEAM** light would be on 30% of the time in 2 second time frames. For actual output, consult the display (fig. 43 #1)

7. This is a **"3 position switch"**. In the **"AUTO"** position, the humidifier will generate steam based on demand signals from the humidistat. In the OFF position, the humidifier will shut off. In the manual **DRAIN** position, the humidifier will stop operating and the motorized drain valve will open to drain out the water.

8. The **"DRAIN"** indicator lights up whenever the motorized drain valve is opened, whether as a result of an automatic drain cycle or because the front panel switch is manually set to **DRAIN**.

8.00 programing features:

8.10 alphanumeric display and control



The Alphanumeric display is the information center whose function is to inform on the actual status of the unit and in case of abnormal operation to describe the malfunction. Through the display menu parameters and may be changed as described below.

8.20 off mode:

When the rocker switch (fig. 2 #7) is in the **OFF** position, the display shows the model of the unit.

example of display:

(fig. #44)

(fig. 45)

8.30 scroll mode:

When the rocker switch (fig. 2 #7) is in the **AUTO** position, the display scrolls the following information every 6 seconds.

this symbol will be used to represent a short time lapse

example of display:		description:	comments:
HUMIDITY 45% RH	**1**	PERCENT OF RELATIVE HUMIDITY (modulating units only)	Indicates actual humidity from HRM or HDM humidistat sensor
lb/hr 36	**2**	OUTPUT	The actual output of the unit at that moment is 36 lb / hr
ALARM LEVEL	**3**	LEVEL LOW ALARM	Below this water level, the humidifier shuts off
		or	
CONTROL LEVEL		MIDDLE LEVEL	Below this water level fill solenoid valve is activated
		or	
HIGH LEVEL		HIGH LEVEL	Fill solenoid valve is deactivated

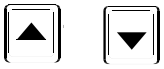
8.40 diagnostic mode:

When the following conditions occur, the diagnostic messages override the scrolling information.

example of display:	description:	comments:
NO DEMAND	NO DEMAND	When the control input signal is 0 vdc or the set point has been reached on the high limit humidistat or the pressure switch
DRAIN CYCLE	DRAIN CYCLE	The unit is in the automatic drain mode
CONTACT DELAY	CONTACT DELAY	15 second delay for the power contactor to be activated
OVER HEATED	OVERHEATED	The temperature inside the container has exceeded the boiling temperature. The humidifier has automatically shut off
PROBE DEFECTED	DEFECTED PROBE	The water level sensor is not operational. The humidifier has automatically shut off
NO LEVEL	NO WATER	Water has not reached the level probe
SERVICE 1000HRS	SERVICE HOURS	The unit has reached 1000 hours of operation and requires service. Note: the large "CHECK" window on the front panel (fig.2 #4) will blink on and off every 4 seconds
FOAMING CYCLE	DRAIN FOAM	AFEC (Anti Foam Energy Conservation) detects foam. The unit drains for a few minutes and returns to normal operation.
DRN/PROB BLOCK	DRAIN OR PROBE BLOCK	The unit drains but the water level does not decrease, the humidifier has automatically shut off.

8.50 menu driven program mode:

The **MENU** button is used to place the SK300 into the program mode and to advance the program function to the next programming step in the menu. Use the **UP / DOWN** buttons to make changes.



example of display:	description:	comments:
SETPOINT 40% RH Modulating units only	STEP 1 By default, setpoint display will not be accessible on the SK300. *To activate set point control connect terminal 9 on modulating humidistat to terminal 5 on the SK300 humidifier*	To enable setpoint display proceed to step #3 by pressing the **MENU** button, the RUNNING message will appear. Press and hold the **TEST** button on the main pc board (Controls section, page 27, fig 13) for 10 seconds, then press the **RESET** button on the main. pc board. Setpoint is now displayed on the LCD
DRAIN 24 HOURS	STEP 2 **Drain**	Choose the initiation of a drain cycle every 1 to 24 or 72 hours. For D.I. units there is a disabled-drain option which can be overridden only by the AFEC system
RUNNING 0645HRS	STEP 3 **Running # hrs**	The unit has operated 645 hours since the last service. Note: After service hours (per step 4) of operation, a SERVICE message will appear and the CHECK light (fig. 2 #4) on the front panel of the unit will blink every 4 seconds. After service has been done, press the **UP / DOWN** buttons simultaneously for 30 seconds to reset the number of hours of operation to zero
SERVICE 1000HRS	STEP 4 **Service # hrs**	Press the **UP** button to select from 400 to 1500 hours settings for service.
LOCK ON 80% PWR Modulating units only	STEP 5 **Output Span**	The humidifier will deliver 80% of its maximum rated output when at full demand

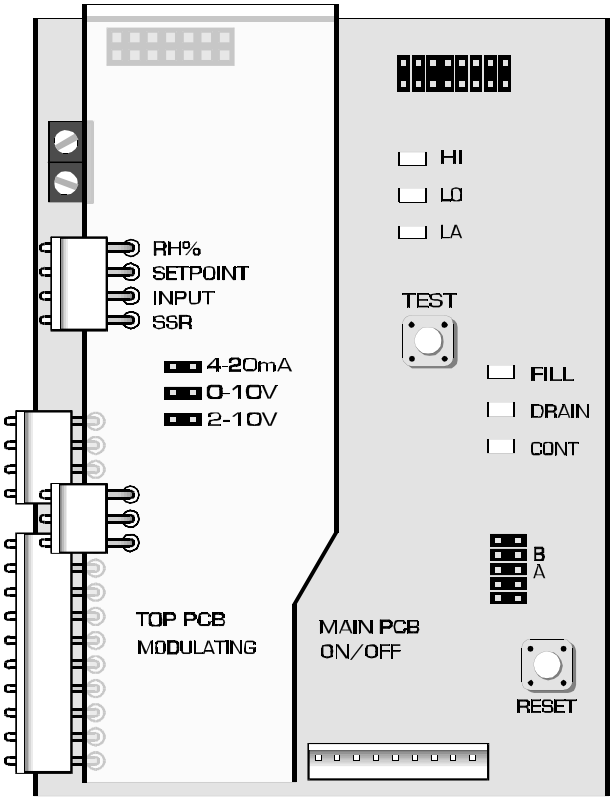
Note:

A) Any changes made in the Program Mode are saved into a non volatile memory.

B) When the SK300 is anywhere in the Menu Driven Program Mode, the normal operation of the unit is halted. To resume normal operation exit the menu program mode by pressing the **MENU** button until the alphanumeric display is clear. (This happens after step 5 "Lock On")

9.00 control p.c. board:

The SK300 humidifier is controlled by an advanced microprocessor-based control system. The basic control system is the same for the ON / OFF or Modulating units. Modulating units are equipped with an additional P.C. board that is mounted on top of the main P.C. board as shown below.



(fig. #46)

9.10 main p.c. board

There are 3 water level L.E.D.'s in the upper right hand side. They indicate the relative water height as sensed by the capacitive sensor. At **HI** level the inlet water solenoid shuts off, at **LO** the solenoid opens and the **LA** indicates water level below which the power to the elements is shut off.
The 3 status L.E.D.'s at the center left side operate as follows: **FILL** indicates the solenoid is feeding water, **DRAIN** indicates the drain valve empties the container and **CONT** indicates power is supplied to the elements and the unit is producing steam.

When commissioning the unit push the **TEST** button to initiate a preprogrammed start-up cycle. The start up cycle cleans the supply water and the steam container. The sequence is as follows:
For the first 30 minutes the **TEST** cycle will feed and simultaneously drain the water in order to flush out any dirt in the water supply lines. This will be followed by **FILL** and 5 minutes boil and **DRAIN** cycles which will be repeated several times. This is to flush out any solder flux, grease or any other substances that may be coating the container or the elements. The start-up cycle will take approximately one hour to complete.
To bypass the start up sequence push the **RESET** button in the lower R.H. corner of the main p.c. board.

9.20 modulating upper p.c. board

The 3 jumpers at the center of the p.c. board are used for proper selection of the incoming control signal. (For details consult section: 6.30 SK300M proportional unit:" Page #19).

10.00 start up procedure:

After all the mechanical and electrical installation steps (as outlined previously) have been carried out, the following start-up procedure should be followed.

A) Turn on the water feed and check that the drain connections are made correctly.

B) Ensure that the power connections and control connections are made correctly.

C) Turn on the power to the humidifier. The **POWER** indicator should go on. If not, proceed to the trouble shooting section.

D) Push the **TEST** button on the main control P.C. board. This will start up a pre-programmed start-up cycle which will flush out any dirt in the humidifier and supply lines. In addition, it will test several functions of the humidifier. The start-up cycle will simultaneously feed and drain water from the steam container for 30 minutes. This is to flush out any dirt in the plumbing lines. Subsequently, the humidifier will fill the steam container and boil for 5 minutes. It will then drain the container. The fill-boil-drain cycle will repeat several times. This is to flush out any solder flux, grease, or any other substance that may be coating the container or elements. The start-up cycle will take approximately one hour to complete.

Note that the front panel switch will not affect the performance of the start-up cycle. To bypass at any time the start-up cycle and to proceed directly into normal operation, press the **RESET** button. (Look at “SK300 controls” (page 11, fig. 1). The front panel switch may be left in the **AUTO** position during the start-up cycle. This will result in normal operation of the humidifier as soon as the start-up cycle is finished. If the front panel switch is left on the **OFF** (middle) position during the start-up cycle, the humidifier will idle after the completion of the start-up cycle.

In the case of modulating humidifiers, there must be a demand signal (at least 50% demand) for the start-up cycle to operate correctly. No damage will result if there is no demand signal. However, boiling may not occur in the second stage of the start-up cycle. This may prevent the clean up and flush out of solder fluxes that may be present in the steam container.

11.00 routine maintenance:

The only routine maintenance required for SK300 humidifiers is a periodic cleaning of the steam container. Although there is an automatic flushing of the steam container, it must be cleaned manually from time to time. Depending on the water quality, the frequency of automatic drain cycles, and the demand placed on the humidifier, this manual cleaning should be performed anywhere from once every two months to once par year. The humidifiers are set to give maintenance demand on the alphanumeric display and on the CHECK light after it has reached the service hours setting between 400 and 1500 hours.

12.00 steam container cleaning instructions:

The steam container and its contents may be extremely hot! Follow these directions to ensure your safety.

1) Ensure that the steam container and its contents are cool. Set the front panel switch to **DRAIN**. Drain out all the water in the steam container. When the container is empty, turn the front panel switch to **AUTO**. This will refill the steam container with fresh cold water. As soon as the container is full and the **FILL** light turns off or the **STEAM** light goes on, turn the front panel switch to **DRAIN**. Drain out all the water in the steam container once again. The container and its contents should now be cool enough to touch. If you feel that the container is still too hot, repeat the operation.

2) Turn the front panel switch to **OFF**. Turn off the main power supply to the humidifier. **Failure to do this may result in a dangerous electrical shock!**

3) Remove the high voltage connector located at the top right hand side of the mechanical compartment. On the SK302 to SK306 this is done by unscrewing and pulling out the female connector. On other models, this is done by squeezing the locking ears of the high voltage connector and pulling out.

4) Remove the level sensor connector. This connector is attached to a cable that enters the mechanical compartment just below the high voltage connector. Squeeze the locking ear of the connector and pull it apart.. Remove the connection to the high limit (klixon) sensor.

5) Remove the steam hose (or hoses) at the top of the steam container.

6) Remove the water drain / feed connection to the steam container. To do this, unscrew the nipple located on the lower right hand side of the mechanical compartment.

7) The steam container may now be freely removed from the cabinet. Take care as there will still be some water (about 1 inch) in the container. **Make sure that your footing is secure when lifting out the steam container. On large units it may weigh more than 30 lb.**

8) Remove the cover from the steam container. On the SK302, SK304 and SK306, unlatch the three latches located at the top of the container. The latches are tight; you may need the help of a screwdriver or pliers to do this. On other models, turn the latches, located around the top of the steam container, to release them. Remove the cover of the steam container

9) Pour out any remaining water and scale that is on the bottom of the container. You may clean out any remaining scale from the container with a stiff brush **(synthetic filament only, not a wire brush)** and some vinegar(or any weak acid made for cleaning stainless steel).

10) The lid of the steam container will, in general, not require cleaning. However, if cleaning is required, it may also be cleaned using a stiff brush and vinegar as outlined above.

11) Remove 2 screws attaching the level sensing protective tube clean the level sensor using a soft cloth. Do not scratch or damage the teflon finish.

12) Rinse out the container and lid thoroughly with water and re-attach the lid to the container. Make sure that the gasket is well placed before tightening the latches. Replace the steam container in the humidifier and tighten the water drain / feed connection nipple.

13) Re-attach the level sensor and high voltage connectors.

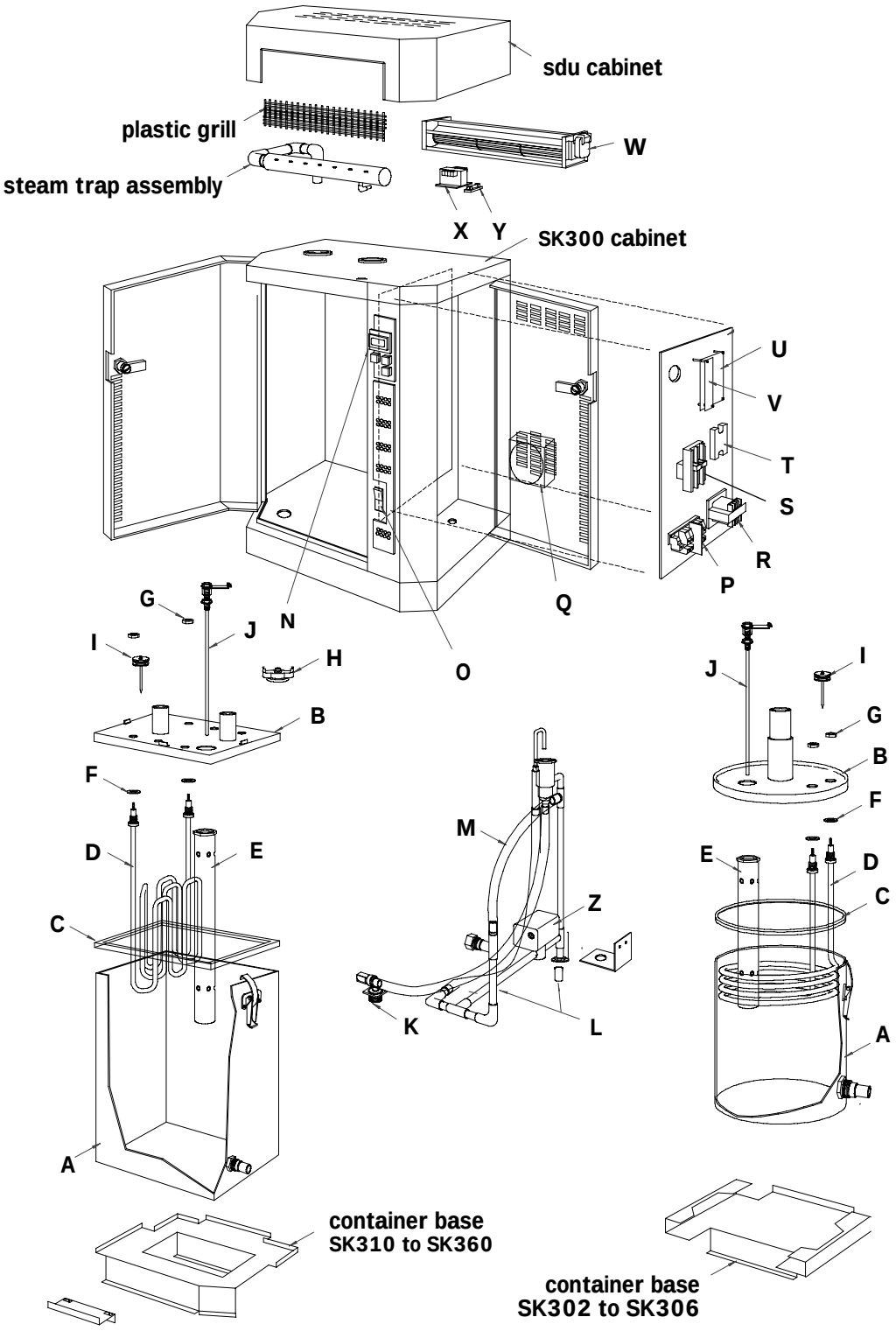
14) Re-apply power to the humidifier, and set the front panel switch to **AUTO**.

15) The humidifier should start to fill with water. If it does not, then check if the **FILL** light is lit on the front panel. If the **FILL** light is on and no water is being fed to the container, check if a valve before the humidifier has been turned off.

16) Note that since the steam container is completely empty, it may take a few minutes to fill. The humidifier may interpret this as being a water feed problem, and the **CHECK** light may turn on. This is not a problem; the **CHECK** light will turn off as soon as there is sufficient water in the humidifier.

17) Once there is sufficient water in the humidifier, and there is a demand for humidity, the humidifier will be back in normal operation.

13.00 exploded view of SK300 humidifier:



13.10 SK300 humidifier parts list:

item	part number	description
A	SW CONTSMA-ASS SW CONTMED-ASS SW CONTLAR-ASS	SK302 to 306 container c / w clamps SK310 to 330 container c / w clamps SK340 to 360 container c / w clamps
B	SP 4018 SP 4019 SP 4183A SP 4183B SP 4186 SP 4185A	SK302 to 306 cover only 1 phase SK302 to 306 cover only 3 phase SK310 to 314 cover only SK320 to 330 cover only SK340 cover only SK360 cover only
C	SP 1008 SP 1021 SP 1022	SK302 to 306 container gasket SK310 to 330 container gasket SK340 / 360 container gasket
D	see parts list below	elements c / w washers (F)

elements					
	voltage	element P/N	transformer	contactor	transformer
SK 302 M	240 / 1	SE 5932	SP 3309	SP 3029	SP 3312 SDU 1
	208 / 1	SE 5933	SP 3300	SP 3029	SP 3305 SDU 1
	480 / 1	SE 5934	SP 3320	SP 3029	SP 3329 SDU 1
	600 / 1	SE 5935	SP 3340	SP 3029	SP 3349 SDU 1
SK 304 M	240 / 1	SE 5937	SP 3309	SP 3029	SP 3312 SDU 1
	208 / 1	SE 5940	SP 3300	SP 3029	SP 3305 SDU 1
	208 / 3	SE 5924	SP 3300	SP 3080	SP 3305 SDU1
	480 / 1	SE 5941	SP 3320	SP 3029	SP 3329 SDU 1
	480 / 3	SE 5923	SP 3320	SP3080	SP 3329 SDU 1
	600 / 1	SE 5942	SP 3340	SP 3029	SP 3349 SDU 1
	600 / 3	SE 5925	SP 3340	SP 3080	SP 3349 SDU 1
SK 306 M	240 / 1	SE 5938	SP 3309	SP 3029	SP 3312 SDU 1
	208 / 1	SE 5943	SP 3300	SP 3029	SP 3305 SDU 1
	208 / 3	SE 5933	SP 3300	SP 3080	SP 3305 SDU 1
	480 / 1	SE 5944	SP 3320	SP 3029	SP 3329 SDU 1
	480 / 3	SE 5934	SP 3320	SP 3080	SP 3329 SDU 1
	600 / 1	SE 5945	SP 3340	SP 3029	SP 3349 SDU 1
	600 / 3	SE 5935	SP 3340	SP 3080	SP 3349 SDU 1
SK 310 M	208 / 3	SE 5959	SP 3300	SP 3100	SP 3306 SDU 2
	480 / 3	SE 5958	SP 3320	SP 3080	SP 3330 SDU 2
	600 / 3	SE 5957	SP 3340	SP 3080	SP 3350 SDU 2
SK 314 M	208 / 3	SE 5946	SP 3300	SP 3220	SP 3306 SDU 2
	480 / 3	SE 5947	SP 3320	SP 3080	SP 3330 SDU 2
	600 / 3	SE 5948	SP 3340	SP 3080	SP 3350 SDU 2
SK 320 M	208 / 3	SE 5949	SP 3300	SP 3027	SP 3351 SDU 3
	480 / 3	SE 5950	SP 3320	SP 3080	SP 3352 SDU 3
	600 / 3	SE 5951	SP 3340	SP 3080	SP 3353 SDU 3
SK 330 M	480 / 3	SE 5952	SP 3320	SP 3220	SP 3352 SDU 3
	600 / 3	SE 5939	SP 3340	SP 3080	SP 3353 SDU 3
SK 340 M	480 / 3	SE 5950	SP 3320	SP 3027	
	600 / 3	SE 5951	SP 3340	SP 3027	
SK 360 M	480 / 3	SE 5952	SP 3320	SP 3027	
	600 / 3	SE 5939	SP 3340	SP 3027	

item	part number	description
E	SP 4196 SP 4197 SP 4198	SK302 / 306 level sensor chamber SK310 / 314 / 320 / 340 level sensor chamber SK330 / 360 level sensor chamber
F	SP 1005	washer (elements)
G	SP 2330	S / S hex jam nut (elements)
H	SP 3035	high temperature switch
I	SW FOAMSM-ASS SW FOAMMED-ASS SW FOAMLG-ASS	SK302 to SK306 foam sensor SK310 / 314 / 320 / 340 foam sensor SK330 / 360 foam sensor
J	SW PROBSM-ASS SW PROBMD-ASS SW PROBLAR-ASS	SK302 to 306 level sensor probe c / w PC board SK310 / 314 / 320 / 340 level sensor probe c / w PC board SK330 / 360 level sensor probe c / w PC board
K	SP 6003	water intake valve
L	SW TRAPSMA-ASS SW TRAPMED-ASS SW TRAPLAR-ASS	SK302 to 306 fill & drain trap assembly SK310 to 330 fill and drain trap assembly SK340 and 360 fill & drain trap assembly
M	SP 1023A	silicone tubing
N	NW SK300DISPL-ASS	SK300 LCD display
O	SP 3037	ON / OFF / DRAIN switch
P	call manufacturer	terminal block & high voltage connectors
Q	SP 3007	DC cooling fan
R	see elements (D)	transformer
S	see elements (D)	contactor
T	SP 3102 SP 3103 SP 3104 SP 3105	solid state relay SSR1600660D55-021 solid state relay SSR1600660D90-021 solid state relay SSR1600660D25-021 solid state relay SSR1600660D125-021
U	NP 9875	SK300 main PC board
V	NP 9877	SK300 modulation PC board
W	SP 3008 SP 3006 SP 3009	SDU 1 fan SDU 2 fan SDU 3 fan
X	see elements (D)	transformer
Y	SP 5105	fuse inside SDU
Z	SP 6010	drain valve

14.00 trouble shooting guide: for normal operation after start-up cycle

symptom	indicator					action	display
	power	check	fill	steam	drain		
humidifier does not function	OFF	OFF	OFF	OFF	OFF	- check that line voltage is present at the appropriate terminal block. * check the low voltage fuse. replace if necessary * check that all the cable harnesses are plugged correctly into the control and front panel P.C. boards * reset the push button the high temperature limit switch on top of the steam cylinder by pushing it.	
	ON	OFF	OFF	OFF	OFF	- check that the front panel switch is set to auto, keep in mind that there is a 15 second delay before the contactor will close * make sure that there is a demand for humidity from the humidistat * make sure that the safety circuit loop (i.e; P.D. switch, high limit) is closed (short circuit between terminals 1 and 2) * push the reset button on the control P.C. board and wait for the 15 second time delay * check that all the cable harnesses are plugged correctly into the control and front panel P.C. boards.	NEP SK320 or NO DEMAND
humidifier does not generate steam	ON	OFF	ON	OFF	OFF	- check if the cylinder is filling with water. If so, wait for the cylinder to fill. If water is entering the cylinder and draining see if the drain valve has been locked open manually * check if there is any water supply * check if there is 24VAC at the fill solenoid. If yes, and the solenoid does not open, then replace the solenoid	NO LEVEL
	ON	OFF	ON	OFF	ON	- the humidifier is performing an automatic drain cycle. either push the reset button on the main P.C. board to stop the drain cycle or wait for the drain cycle to complete (about 7 minutes).	DRAIN CYCLE or FOAM CYCLE
	ON ON	ON OFF	ON OFF	OFF ON	OFF OFF	- there is not enough water in the cylinder. check if there is any water supply to the humidifier and that the drain is not manually locked open * check if there is 24VAC at the fill solenoid. If yes and the solenoid does not open, then replace the solenoid * note that it may take several minutes for the cylinder to fill with water. the check indicator may go on for a few minutes and then go out when the cylinder is full * note that it may take several minutes to commence steam generation * check that there is high voltage on each of the heating elements. If not, then check if the wiring from the contactor to the element is disconnected somewhere along the way * If high voltage is present on the elements, using an amprobe, check that there is the correct current flow through each element. If any element has no current flowing through it, disconnect the high voltage from the element and, using an ohm meter, check if that element is open circuit, replace it * *check that the contactor is activated * check if there is a 22 volts D.C. between the input of the SSR (+,-) * if no input voltage is present at the SSR, press the reset button. If the problem continues, then replace the modulating board * if there is voltage at the input of the SSR, then replace it*	NO LEVEL HUMIDITY 45% RH lb/hr 36 ALARM LEVEL CONTROL LEVEL HIGH LEVEL NORMAL SCROLL
humidifier will not stop generating steam	ON	OFF	ON or OFF	ON	OFF	- press the **reset** button on the main P.C. board and wait to see if the problem continues * check if there is no demand for humidity * check the polarity of common and 24 volts at the humidistat and the humidifier * check if the main contactor is stuck closed. If yes replace the contactor *	
no auto drain cycles	ON	OFF	ON or OFF	ON or OFF	OFF	- check if the drain cycle jumper selections are correctly made * press the reset button after changing drain cycle period selection	

trouble shooting guide: for normal operation after start-up cycle

symptom	indicator					action	display
	power	check	fill	steam	drain		
always on drain cycle	ON	OFF	ON	OFF	ON	- check that the conductive probe (anti-foam) is not grounded without water * disconnect the conductive probe and reset the main P.C. board. If the problem continues, then disconnect the power and remove U4 (LM1830) on the main P.C. board and replace it.	DRAIN FOAM
will not stop draining	ON	ON or OFF	ON or OFF	OFF	ON or OFF	- check if the front panel switch is not on the drain position * push the reset button on the control P.C. board * make sure that the drain valve is not locked in the manual drain position * *make sure that the height of the capacity sensor is all the way down otherwise the water level will rise too much causing an over flow.*	NEP SK320 or NO LEVEL
	ON	ON	OFF	OFF	OFF	*- the electronic temperature sensor inside the capacity probe sensed abnormal temperature. Replace the capacity / temperature sensor assembly. (SK300 "parts" section, intem "J")*	OVER HEATED
	ON	ON	OFF	OFF	OFF	*- the water level probe has been mechanically damaged. Replace the complete level sensor assembly. (SK300 "parts" section, intem "J")*	PROBE DEFECTED
will not drain	ON	ON	OFF	OFF	OFF	*- the water level probe sensed the water level has not decreased. Make sure the drain and the level sensor chamber are not blocked.*	DRN/PROB BLOCK

15.00 warranty

1. General

Unless otherwise arranged, in writing, the acceptance of the Order Confirmation by the purchaser includes acceptance of the "General Conditions of Sale and Warranty" of National Environmental Products, Ltd hereafter referred to as NEP.

2. Incoterms

The international rules for interpretation of trade terms "Incoterms" as defined by the ICC Incoterms publication no. 460 from 1990, shall apply to the commercial terms used herein.

3. Confirmation of Order

- NEP shall not be deemed to have accepted an order until written "Order Confirmation" from NEP is issued to the purchaser.
- It is the responsibility of the purchaser to verify that all information concerning his / her order is correct and to notify NEP In writing, of any discrepancy prior to the order being shipped. I n the event of a change or correction to an existing order, a second "Order Confirmation" will be issued by NEP.

4. Price

- Our prices are net, Ex-works Montreal in U.S. Currency, unless stated otherwise.
- Minimum orders shall be $50.00 minimum.
- Shipping and Handling charges are $5.00 minimum per order
- unless the shipment is billed to the purchaser's account or shipped freight collect.
- NEP reserves the right to adjust accepted prices in the event of alterations in rates of exchange, variations in costs of materials, changes in wages, interference on the part of the Government or similar conditions over which NEP has no control.

5. Payments terms

Major credit cards, C.O.D., Prepayment.

- For open account, invoices are payable within 30 days from the
- date of invoice without no deduction, unless specify otherwise.
- An interest charge of 2% per month will be included on all overdue payments.
- No new order will be process if invoices are not paid within 45 days.

6. Transfer of ownership

The goods shall remain the property of NEP until the full payment for the goods has been received by NEP.

7. Delivery terms

Shipments are Ex-works 400 Lebeau,St Laurent,Quebec, H4N 1R6, CANADA

- unless notified otherwise.
- Unless special instructions, the order will be delivery in the way which NEP deems best without guaranteeing this to be the cheapest way of transport.
- For International Order, a written designation naming the freight forwarding agent is required and will remain in effect until notified otherwise.
- Any discrepancy, damage or breakage should be reported in writing both to NEP and to the Carrier within 5 working days from the receipt date.

8. Risk

From the moment of delivery, the purchaser shall bear all risks for the goods and NEP shall not be responsible for loss and damage incurred during transportation.

9. Delivery time

Delivery time is stated approximately and depends on the product ordered, please allow a minimum of:

- a) 2 weeks for processing North American order.
- b) 6 weeks for processing International order.
- We will make every effort to adhere to our delivery promises, but will not accept order or contract cancellation or any liability for
- any direct or indirect losses that may arise for any reason whatsoever as a result of our failure to adhere to such promises.

10.Return of good

Goods received by the purchaser cannot be returned unless a completed "R.M.A. Form" (Return Material Authorization Form) has

- been issued by NEP's Customer Service.
- Any returned goods must be sent to NEP 400 Lebeau, St Laurent, Quebec, H4N 1R6, CANADA, unless stated otherwise
- by the R.M.A. Form, accompanied with the completed "R.M.A. Form", the R.M.A. number shall be prominently displayed on the shipping box. Unauthorized returns will be refused.
- Any returned goods must be sent freight prepaid. Any goods that come to us freight collect will be refused and returned to sender
- unless previously agreed to by us in writing on the "R.M.A. Form".
- Goods returned for credit shall be in condition for resale in the original box and properly packaged. Units, accessories or components that have been installed are not returnable and not refundable.
- Credit is subject to an overhead charge of 30% of the invoice plus shipping & handling if returned within 30 days of the invoice date and 50% from 30 to 60 days.
- Non standard product (SK units with special feature), Multisteam manifolds and any DI unit are not returnable and not refundable.

11. Warranty

- Provided that the terms of payment are observed, the purchaser is offered a warranty of 24 months from the original purchase date of delivery for any NEP's standard product, provided the
- equipment has been properly installed and operated in accordance with NEP instructions.
- The warranty covers faulty manufacture, design and / or defective materials. The warranty shall cease to be valid in the event of misapplication, incorrect installation, improper maintenance or any other incorrect uses or misuse of the product.
- For the SK series, the warranty furthermore ceases to be valid if the user disconnects or removes any electronic or mechanical components prior disconnecting the input power.
- NEP assumes no responsibility for repairs made on equipment, unless performed by NEP's authorized personnel.
- The defective product or component shall be returned in accordance with the paragraph 10 (Returns of goods) as described in this document.
- NEP agrees under the warranty to repair or replace (at the discretion of NEP) such standard product or component, which upon examination by NEP are found to be defective.
- Product or component replaced or repaired under warranty will be sent back to the purchaser, standard freight paid by NEP.
- Expenses in connection with travelling time, dismantling and mounting shall not be paid by NEP
- Guarantee for products or components sold but not manufactured by NEP, is only given to the same extent as given to NEP,
- however, not exceeding the normal NEP warranty.

12. Proper law and jurisdiction

- This contract is and shall be deemed to have been made in the province of Quebec, CANADA, and shall in all respects, be governed by the province of Quebec laws